2002 Linked Birth/lnfant Death Birth Cohort Data Set

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Linked Birth/Infant Death Data Set – 2002 Birth Cohort

Introduction

This documentation is for the 2002 birth cohort linked birth/infant death data set (linked file). Previous birth cohort linked files were released for data years 1983-91. Beginning with 1995 data, the linked file was released in two different formats - period data and birth cohort data.

Period data - The numerator for the 2002 period linked file consists of all infant deaths occurring in 2002 linked to their corresponding birth certificates, whether the birth occurred in 2001 or 2002. The denominator for this data set is all births occurring in 2002.

Birth cohort data - The numerator of the 2002 birth cohort linked file consists of deaths to infants born in 2002 linked to their corresponding birth certificates, whether the death occurred in 2002 or 2003. The denominator for this data set is all births occurring in 2002.

For most purposes, differences between the birth cohort and period linked files are negligible. However, birth cohort files are preferred for multivariate and some other types of detailed analysis because they follow a given cohort of births for an entire year to ascertain their mortality experience. This is generally considered to be a more robust methodology than the period file, which is essentially cross-sectional in nature.

The 2002 birth cohort linked file includes several separate data files. The first file includes linked birth and death certificate data for all US infants born in 2002 who died before their first birthday - referred to as the numerator file. The second file contains information from the death certificate for all US infant death records which could not be linked to their corresponding birth certificates - referred to as the unlinked file. The third file is the 2002 NCHS natality file for the US with a few minor modifications - referred to as the denominator-plus file. These same three data files are also available for Puerto Rico, the Virgin Islands, and Guam.

For the denominator-plus file, selected variables from the numerator file have been added to the denominator file to facilitate processing. These variables include age at death (and recodes), underlying cause of death (and the 130-cause recode), place of accident, and record weight. These variables are the most widely used variables from the numerator file. When the number of variables required from the numerator file is limited, the denominator-plus file may be used by itself for ease of programming. Infant death identification numbers are also included, so that the same infant can be uniquely identified and matched between the numerator and denominator-plus files.

Weighting

In part to correct for known biases in the data, changes were made to the linked file beginning with the 1995 data year. These changes include the addition of a record weight and an imputation for not-stated birthweight. In the 2002 birth cohort linked file, 99.0% of infant death records were linked to their corresponding birth certificates. Overall, 1.0% of infant death records could not be linked because the matching birth certificate could not be found; however this percent varied considerably by State (see section Table 1 below). The number of infant deaths in the linked file are weighted to equal the sum of the linked plus unlinked infant deaths by age at death and state. The formula for computing the weights is as follows:

$$\frac{\text{number of linked infant deaths + number of unlinked infant deaths}}{\text{number of linked infant deaths.}}$$

A separate weight is computed for each State of residence of birth and each age at death category (<1 day, 1-27 days, 28 days-1 year). Thus, weights are 1.0 for states which link all of their infant deaths. These weights have been added to all linked infant death records in the numerator file, and in the denominator-plus file. In the denominator-plus file, records for surviving infants have been assigned a weight of 1.0. This causes the denominator-plus file to weight up to 292 more than the total number of live births (about 4 million), thus most runs on live birth data from the denominator-plus file should be run unweighted. Weights have not been computed for the Puerto Rico, Virgin Islands, and Guam files.

The researcher should be aware that the use of the weights is appropriate for some, but not all applications. Weights should be used when computing the total number of infant deaths or the number of infant deaths by characteristics, either from the numerator or the denominator-plus files. Weights should not be used when computing the total number of live births or the number of live births by characteristics from the denominator-plus file, as the use of weights under these circumstances will yield a slight overestimate of the total number of US births. For multivariate analysis, the use of weights is generally recommended, however, a decision should be made on an individual basis, depending on the type of multivariate technique used, and the goals of the particular analysis.

Imputed birthweight

An imputation for not-stated birthweight has been added to the data set, to reduce potential bias in the computation of birthweight-specific infant mortality rates. Basically, if birthweight is not-stated and the period of gestation is known, birthweight is assigned the value from the previous record with the same period of gestation, race, sex, and plurality. Imputed values are flagged. The addition of this imputation reduced the percent of not-stated responses for birthweight, thus reducing (but not eliminating) the potential for underestimation when computing birthweight-specific infant mortality rates.

Methodology

The methodology used to create the national file of linked birth and infant death records takes advantage of two existing data sources:

1. State linked files for the identification of linked birth and infant death certificates; and

2. NCHS natality and mortality computerized statistical files, the source of computer records for the two linked certificates.

Virtually all States routinely link infant death certificates to their corresponding birth certificates for legal and statistical purposes. When the birth and death of an infant occur in different States, copies of the records are exchanged by the State of death and State of birth in order to effect a link. In addition, if a third State is identified as the State of residence at the time of birth or death, that State is also sent a copy of the appropriate certificate by the State where the birth or death occurred.

The NCHS natality and mortality files, produced annually, include statistical data from birth and death certificates that are provided to NCHS by States under the Vital Statistics Cooperative Program (VSCP). The data have been coded according to uniform coding specifications, have passed rigid quality control standards, have been edited and reviewed, and are the basis for official U.S. birth and death statistics.

To initiate processing, NCHS obtained matching birth certificate numbers from States for all infant deaths that occurred in their jurisdiction. We used this information to extract final, edited mortality and natality data from the NCHS natality and mortality statistical files. Individual birth and death records were selected from their respective files and linked into a single statistical record, thereby establishing a national linked record file.

After the initial linkage, NCHS returned to the States where the death occurred computer lists of unlinked infant death certificates for follow up linking. If the birth occurred in a State different from the State of death, the State of birth identified on the death certificate was contacted to obtain the linking birth certificate. State additions and corrections were incorporated, and a final, national linked file was produced.

Characteristics of Unlinked File

For the 2002 birth cohort linked file 292, or 1.0% of all infant death records could not be linked to their corresponding birth certificates. Unlinked records are included in a separate data file in

this data set. The unlinked record file uses the same record layout as the numerator file of linked birth and infant death records. However, except as noted below, tape locations 1-210, reserved for information from the matching birth certificate, are blank since no matching birth certificate could be found for these records. The sex field (tape location 79) contains the sex of infant as reported on the death certificate, rather than the sex of infant from the birth certificate, which is not available. The race field (tape location 36-37) contains the race of the decedent as reported on the death certificate rather than the race of mother as reported on the birth certificate as is the case with the linked record file. The race of mother on the birth certificate is generally considered to be more accurate than the race information from the death certificate. Also, date of birth as reported on the death certificate is used to generate age at death.

Documentation table 6 shows counts of unlinked records by race and age at death for each State of residence. The user is cautioned in using table 6 that the race and residence items are based on information reported on the death certificate; whereas, tables 1-5 present data from the linked file in which the race and residence items are based on information reported on the birth certificate.

Percent of Records Linked

The 2002 birth cohort linked file includes 27,535 linked infant death records and 292 unlinked infant death records by place of occurrence. The linked file is weighted to the sum of linked plus unlinked records, thus the total number of weighted infant deaths by place of occurrence is 27,827. Table 1 shows the percent of infant deaths linked by State of residence. While most States link a high percentage of infant deaths, linkage rates for some States are below the national average.

Geographic classification

Geographic codes in this data set reflect the results of the 1990 census. Because of confidentiality concerns, only those counties and cities with a population size of 250,000 or more are separately identified in this data set. Users should refer to the geographic code outline in this document for the list of available areas and codes.

For events to be included in the linked file, both the birth and death must occur inside the 50 States and D.C. in the case of the 50 States and D.C. file; or in Puerto Rico, the Virgin Islands or Guam in the case of the Puerto Rico, Virgin Islands and Guam file. In tabulations of linked data and denominator data events occurring in each of the respective areas to nonresidents are included in tabulations that are by place of occurrence, and excluded from tabulations by place of residence. These exclusions are based on the usual place of residence of the mother. This item is contained in both the denominator file and the birth section of the numerator (linked) file. Nonresidents are identified by a code 4 in location 11 of these files.

Table 1. Percent of infant deaths linked by state of residence of birth: United States, 2002 birth cohort

United States	99.0	Nebraska	100.0
Alabama	100.0	Nevada	99.5
Alaska	96.4	New Hampshire	100.0
Arizona	99.6	New Jersey	97.7
Arkansas	99.7	New Mexico	99.4
California	97.8	New York State (no NYC)	99.4
Colorado	100.0	New York City	98.9
Connecticut	100.0	North Carolina	99.9
Delaware	100.0	North Dakota	100.0
District of Columbia	99.5	Ohio	99.8
Florida	99.7	Oklahoma	95.3
Georgia	100.0	Oregon	100.0
Hawaii	100.0	Pennsylvania	99.6
Idaho	100.0	Rhode Island	100.0
Illinois	97.5	South Carolina	100.0
Indiana	98.6	South Dakota	100.0
Iowa	99.5	Tennessee	99.9
Kansas	98.4	Texas	96.6
Kentucky	99.7	Utah	99.7
Louisiana	97.8	Vermont	100.0
Maine	100.0	Virginia	99.7
Maryland	99.6	Washington	100.0
Massachusetts	96.6	West Virginia	100.0
Michigan	99.7	Wisconsin	100.0
Minnesota	100.0	Wyoming	100.0
Mississippi	100.0		
Missouri	100.0		
Montana	98.8		

Demographic and Medical Classification

The documents listed below describe in detail the procedures employed for demographic classification on both the birth and death records and medical classification on death records. These documents, while not absolutely essential to the proper interpretation of the data for a number of general applications, should nevertheless be studied carefully prior to any detailed analysis of demographic or medical data variables. In particular, there are a number of exceptions to the ICD rules in multiple cause-of-death coding which, if not treated properly, may result in faulty analysis of the data. Volumes 1, 2 and 3 of the ICD-10 may be purchased from the World Health Organization (WHO) Publication Center USA, 49 Sheridan Avenue, Albany, New York, 12210 (http://www.who.int/whosis/icd10/index.html). Instruction manuals listed are available electronically on the NCHS website at:
http://www.cdc.gov/nchs/about/major/dvs/im.htm

Change in Cause-of-Death Classification

In data year 1999, a new classification system for coding causes of death was implemented in the United States: the Tenth Revision of the International Classification of Diseases (ICD-10) developed by the World Health Organization (WHO). Information about the new system can be obtained at the following address: http://www.cdc.gov/nchs/about/major/dvs/icd10des.htm

Underlying Cause of Death Data

Mortality statistics by cause of death are compiled from entries on the medical certification portion of the death certificate. The U.S. Standard Certificate of Death is shown in the Mortality Technical Appendix which is included in this documentation. Causes of death include "all those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced these injuries". The medical certification of death is divided into two sections. In Part I, the physician is asked to provide the causal chain of morbid conditions that led to death, beginning with the condition most proximate to death on line (a) and working backwards to the initiating condition. The lines (a) through (d) in Part I are connected by the phrase "due to, or as a consequence of." They were designed to encourage the physician to provide the causally related sequence of medical conditions that resulted in death. Thus, the condition on line (a) should be due to the condition on line (b), and the condition on line (b) should be a consequence of the condition on line (c), etc., until the full sequence is described back to the originating or initiating condition. If only one step in the chain of morbid events is recorded, a single entry on line (a) is adequate. Part I of the medical certification is designed to facilitate the selection of the underlying cause of death when two or more causes are recorded on the certificate. The underlying cause of death is defined by the WHO in the ICD-10 as "(a) the disease or injury which initiated the chain of morbid events leading directly to death, or (b) the circumstances of the accident or violence that produced the fatal injury" and is generally considered the most useful cause from a public health standpoint.

Part II of the cause-of-death section of the death certificate solicits other conditions that the certifier believed contributed to death, but were not in the causal chain. While some details of the death certificate vary by State, all States use the same general format for medical certification outlined in the U.S. Standard Certificate. The U.S. Standard Certificate, in turn, closely follows the format recommended by the WHO.

If the death certificate is properly completed, the disease or condition listed on the lowest used line in Part I is usually accepted as the underlying cause of death. This is an application of "The General Principle." The General Principle is applied unless it is highly improbable that the condition on the lowest line used could have given rise to all of the diseases or conditions listed above it. In some cases, the sequence of morbid events entered on the death certificate is not specified correctly. A variety of errors may occur in completing the medical certification of death. Common problems include the following: The causal chain may be listed in reverse order; the distinction between Part I and Part II may have been ignored so that the causal sequence in Part I is simply extended unbroken into Part II; or the reported underlying cause is unlikely, in an etiological sense, to have caused the condition listed above it. In addition, sometimes the certifier attributes the death to uninformative causes such as cardiac arrest or pulmonary arrest.

To resolve the problems of incorrect or implausible cause-of-death statements, the WHO designed standardized rules to select an underlying cause of death from the information available on the death certificate that is most informative from a public health perspective. The rules for the Tenth Revision as updated by WHO since the publication of ICD-10 are described in NCHS instruction manual Part 2A. Coding rules beyond the General Principle are invoked if the cause-of-death section is completed incorrectly or if their application can improve the specificity and characterization of the cause of death in a manner consistent with the ICD. The rules are applied in two steps: selection of a tentative underlying cause of death, and modification of the tentative underlying cause in view of the other conditions reported on the certificate in either Part I or Part II. Modification involves several considerations by the medical coder: determining whether conditions in Part II could have given rise to the underlying cause, giving preference to specific terms over generalized terms, and creating linkages of conditions that are consistent with the terminology of the ICD.

For a given death, the underlying cause is selected from the condition or conditions recorded by the certifier in the cause-of-death section of the death certificate. NCHS is bound by international agreement to make the selection of the underlying cause through the use of the ICD-10 classification structure, and the selection and modification rules contained in this revision of the ICD. These rules are contained in a computer software program called ACME (Automated Classification of Medical Entities). ACME does exactly what a coder would do to select the underlying cause of death. The ACME program has been used for final mortality data since 1968.

The WHO selection rules take into account the certifier's ordering of conditions and their causal relationships to systematically identify the underlying cause of death. The intent of these rules is to improve the usefulness of mortality statistics by giving preference to certain classification categories over others and consolidating two or more conditions on the certificate into a single classification category.

Multiple Cause of Death Data

The limitations of the underlying cause concept and the need for more comprehensive data suggested the need for coding and tabulating all conditions listed on the death certificate. Coding all listed conditions on the death certificate was designed with two objectives in mind. First, to facilitate studies of the relationships among conditions reported on the death certificate, which require presenting each condition and its location on the death certificate in the exact manner given by the certifier. Secondly, the coding needed to be carried out in a manner by which the underlying cause-of-death could be assigned using the WHO coding rules. Thus, the approach in developing multiple cause data was to provide two fields: 1) entity axis and 2) record axis. For entity axis, NCHS suspends the provisions of the ICD that create linkages between conditions for the purpose of coding each individual condition, or entity, with minimum regard to other conditions present on the death certificate.

Record axis is designed for the generation of person-based multiple cause statistics. Person-based analysis requires that each condition be coded within the context of every other condition on the same death certificate and modified or linked to such conditions as provided by ICD-10. By definition, the entity data cannot meet this requirement since the linkage provisions modify the character and placement of the information originally recorded by the certifier. Essentially, the axis of the classification has been converted from an entity basis to a record (or person) basis. The record axis codes are assigned in terms of the set of codes that best describe the overall medical certification portion of the death certificate.

This translation is accomplished by a computer system called TRANSAX (Translation of Axis). TRANSAX selectively uses the traditional linkage and modification rules for mortality coding. Underlying cause linkages which simply prefer one code over another for purposes of underlying cause selection are not included. Each entity code on the record is examined and modified or deleted as necessary to create a set of codes that are free of contradictions and are the most precise within the constraints of ICD-10 and medical information on the record. Repetitive codes are deleted. The process may 1) combine two entity axis categories together to a new category thereby eliminating a contradiction or standardizing the data; or 2) eliminate one category in favor of another to promote specificity of the data or resolve contradictions. The following examples from ICD-10 illustrate the effect of this translation:

Case 1: When reported on the same record as separate entities, cirrhosis of liver and alcoholism are coded to K74.6 (Other and unspecified cirrhosis of liver) and

F10.2 (Mental and behavioral disorders due to use of alcohol; dependence syndrome), respectively. Tabulation of records with K74.6 would imply that such records had no mention of alcohol. A preferable code would be K70.3 (Alcoholic cirrhosis of liver) in lieu of both K74.6 and F10.2.

Case 2: If "gastric ulcer" and "bleeding gastric ulcer" are reported on a record they are coded to K25.9 (Gastric ulcer, unspecified as acute or chronic, without mention of hemorrhage or perforation) and K25.4 (Gastric ulcer, chronic or unspecified with hemorrhage), respectively. A more concise code is K25.4 which shows both the gastric ulcer and the bleeding.

Entity Axis Codes

The original conditions coded for selection of the underlying cause-of-death are reformatted and edited prior to creating the public-use data file. The following paragraphs describe the format and application of entity axis data.

1. Format. Each entity-axis code is displayed as an overall seven byte code with subcomponents as follows:

1. Line indicator: The first byte represents the line of the death certificate on which the code appears. Six lines (1-6) are allowable with the fourth and fifth denoting one or two written in "due to"s beyond the three lines provided in Part I of the U.S. standard death certificate. Line "6" represents Part II of the death certificate.

2. Position indicator: The next byte indicates the position of the code on the line, i.e., it is the first (1), second (2), third (3) .... eighth (8) code on the line.

3. Cause category: The next four bytes represent the ICD-10 cause code.

4. The last byte is blank.

A maximum of 20 of these seven byte codes are captured on a record for multiple cause purposes. This may consist of a maximum of 8 codes on any given line with up to 20 codes distributed across three or more lines depending on where the subject conditions are located on the certificate. Codes may be omitted from one or more lines, e.g., line 1 with one or more codes, line 2 with no codes, line 3 with one or more codes.

In writing out these codes, they are ordered as follows: line 1 first code, line 1 second code, etc. ---- line 2 first code, line 2 second code, etc. ----- line 3 ---- line 4 ----- line 5 ----- line 6. Any space remaining in the field is left blank. The specifics of locations are contained in the record

layout given later in this document.

2. Edit. The original conditions are edited to remove invalid codes, reverify the coding of certain rare causes of death, and assure age/cause and sex/cause compatibility. Detailed information relating to the edit criteria and the sets of cause codes which are valid to underlying cause coding and multiple cause coding are provided in NCHS Instruction Manual Part 11.

3. Entity Axis Applications. The entity axis multiple cause data file is appropriate for analyses that require that each condition be coded as a stand alone entity without linkage to other conditions and/or require information on the placement of such conditions in the death certificate. Within this framework, the entity data are appropriate to examine relationships among conditions and the validity of traditional assumptions in underlying cause selection. Additionally, the entity data provide in certain categories a more detailed code assignment that could be excluded in creating record axis data. Where such detail is needed for a study, the user should use entity data. Finally, the researcher may not wish to be bound by the assumptions used in the axis translation process.

The main limitation of entity axis data is that it does not necessarily reflect the best code for a condition when considered within the context of the medical certification as a whole. As a result, certain entity codes can be misleading or even contradict other codes in the record. For example, category K80.2 is titled "Calculus of gallbladder without cholecystitis." Within the framework of entity codes this is interpreted to mean that the codable entity itself contained no mention of cholecystitis rather than that cholecystitis was not mentioned anywhere on the record. Tabulation of records with a "K80.2" as a count of persons having Calculus of gallbladder without cholecystitis would therefore be erroneous. This illustrates the fact that under entity coding the ICD-10 titles cannot be taken literally. The user should study the rules for entity coding as they relate to his/her research prior to use of entity data. The user is further cautioned that the inclusion notes in ICD-10 that relate to modifying and combining categories are seldom applicable to entity coding (except where provided NCHS Instruction Manual Part 2b).

In tabulating the entity axis data, one may count codes with an individual code representing the number of times the condition(s) appears in the file. In this kind of tabulation of morbid conditions, the counts among categories may be added together to produce counts for groups of codes. Alternatively, subject to the limitations given above, one may count persons having mention of the disease represented by a code or codes. In this instance it is not correct to add counts for individual codes to create person counts for groups of codes. Since more than one code in the researcher's interest may appear together on the certificate, totaling must account for higher order interactions among codes. Up to 20 codes may be assigned on a record; therefore, a 20-way interaction is theoretically possible. All totaling must be based on mention of one or more of the categories under investigation.

Record Axis Codes

The following paragraphs describe the format and application of record-axis data. Part 2f of the Instruction Manual Series (ICD-10 TRANSAX Disease Reference Tables for classifying Multiple Causes-of-Death) describes the TRANSAX process for creating record axis data from entity axis data.

1. Format. Each record (or person) axis code is displayed in five bytes. Location information is not relevant. The Code consists of the following components:

1. Cause category: The first four bytes represent the ICD-10 cause code.

2. The last byte is blank.

Again, a maximum of 20 codes are captured on a record for multiple cause purposes. The codes are written in a 100-byte field in ascending code number (5 bytes) order with any unused bytes left blank.

2. Edit. The record axis codes are edited for rare causes and age/cause and sex/cause compatibility. Likewise, individual code validity is checked. The valid code set for record axis coding is the same as that for entity coding.

3. Record Axis Applications. The record axis multiple cause data are the basis for NCHS core multiple cause tabulations. Location of codes is not relevant to this data, and conditions have been linked into the most meaningful categories for the certification. The most immediate consequence for the user is that the codes on the record already represent mention of a disease assignable to that particular ICD-10 category. This is in contrast to the entity code which is assigned each time such a disease is reported on different lines of the certification. Secondly, the linkage implies that within the constraints of ICD-10 the most meaningful code has been assigned. The translation process creates for the user a data file that is edited for contradictions, duplicate codes, and imprecisions. In contrast to entity axis data, record axis data are classified in a manner comparable to underlying cause of death classification thereby facilitating joint analysis of these variables. A potential disadvantage of record axis data is that some detail is sacrificed in a number of the linkages.

The user can take the record axis codes as literally representing the information conveyed in ICD-10 category titles. While knowledge of the rules for combining and linking and coding conditions is useful, it is not a prerequisite to meaningful analysis of the data as long as one is willing to accept the assumptions of the axis translation process. The user is cautioned, however, that due to special rules in mortality coding, not all linkage notes in ICD-10 are used. (NCHS Instruction Manual Part 2f).

The user should proceed with caution in using record axis data to count conditions as opposed to people with conditions, since linkages have been invoked and duplicate codes have been eliminated. As with entity data, person-based tabulations that combine individual cause categories must take into account the possible interaction of up to 20 codes on a single certificate.

Additional Information

In using the NCHS multiple cause data files, the user is urged to review the information in this document and its references. The instructional material does change from year to year and ICD revision to ICD revision. The user is cautioned that coding of specific ICD-10 categories should be checked in the appropriate instruction manual. What may appear on the surface to be the correct code by ICD-10 may in fact not be correct as given in the instruction manuals.

If on the surface it is not obvious whether entity axis or record axis data should be employed in a given application, detailed examination of NCHS Instruction Manual Part 2f and its attachments will probably provide the necessary information to make a decision. It allows the user to determine the extent of the trade-offs between the two sets of data in terms of specific categories and the assumption of axis translation. In certain situations, a combination of entity and record axis data may be the more appropriate alternative.

Linked Birth/Infant Death Data Set: 2002 Birth Cohort Data

I. Numerator File:

United States

A. Record count:	27,535
B. Record length:	535
C. Data counts:	a. By occurrence: 27,535
	b. By residence: 27,508
	c. To foreign residents: 27

Territories

A. Record count:	534
B. Record length:	535

II. Denominator File:

United States

A. Record count:	4,027,475
B. Record length:	230
C. Data counts:	a. By occurrence: 4,027,475
	b. By residence: 4,021,825
	c. To foreign residents: 5,650

Territories

A. Record count:	57,793
B. Record length:	230

III. Unlinked File:

United States

A. Record count:	292
B. Record length:	535
C. Data counts:	a. By occurrence: 292
	b. By residence: 292
	c. To foreign residents: 0

Territories

A. Record count:	4
B. Record length:	535

Linked Birth/Infant Death Data Set - 2002 Birth Cohort Data
List of Data Elements and Locations

Data Items	Denominator-Plus File	Numerator File Birth	Death	Unlinked File
1. General				
a. Match status	1	1	--	1
b. Infant death number	2-6	2-6	--	--
c. Year of birth	7-10	7-10	--	--
d. Year of death	--	--	524-527	524-527
e. Resident status	11	11	505	505
f. Record weight	223-230	--	223-230	--
2. Occurrence				
a. FIPS state	14-15	14-15	508-509	508-509
b. FIPS county	16-18	16-18	510-512	510-512
3. Residence				
a. FIPS state	19-20	19-20	513-514	513-514
b. FIPS county	21-23	21-23	515-517	515-517
c. FIPS place	24-28	24-28	518-522	518-522
d. NCHS state	12-13	12-13	506-507	506-507
4. Infant				
a. Age	211-214	--	211-214	211-214*
b. Race	--	--	--	35-38**
c. Sex	78-79	78-79	--	78-79**
d. Gestation	70-77	70-77	--	--
e. Birthweight	80-87	80-87	--	--
f. Plurality	88-89	88-89	--	--
g. Apgar score	90-91	90-91	--	--
h. Day of week of birth/death	209	209	532	532
i. Month of birth/death	205-206	205-206	528-529	528-529
5. Mother				
a. Age	29-32	29-32	--	--
b. Race	35-38	35-38	--	--
c. Education	39-41	39-41	--	--
d. Marital status	42-43	42-43	--	--
e. Place of birth	44-46	44-46	--	--
f. Hispanic origin	33-34	33-34	--	--
6. Father				
a. Age	60-62	60-62	--	--
b. Race	65-66	65-66	--	--
c. Hispanic origin	63-64	63-64	--	--

Data Items	Denominator-Plus File	Numerator File Birth	Numerator File Death	Unlinked File
7. Pregnancy items				
a. Month prenatal care began	51-53	51-53	--	--
b. Number of prenatal visits	54-55	54-55	--	--
c. Adequacy of care recode	56	56	--	--
d. Total birth order	47-48	47-48	--	--
e. Live birth order	49-50	49-50	--	--
8. Medical and Health Data				
a. Method of delivery	92-99	92-99	--	--
b. Medical risk factors	100-117	100-117	--	--
c. Other risk factors				
Tobacco	118-121	118-121	--	--
Alcohol	122-125	122-125	--	--
Weight gain during pregnancy	126-128	126-128	--	--
d. Obstetric procedures	129-136	129-136	--	--
e. Complications of labor and/or delivery	137-153	137-153	--	--
f. Abnormal conditions of the newborn	154-163	154-163	--	--
g. Congenital anomalies	164-186	164-186	--	--
h. Underlying cause of death			216-219	216-219
i. 130 Infant cause recode			220-222	220-222
j. Multiple conditions			261-504	261-504
9. Other items				
a. Place of delivery	67	67	--	--
b. Attendant at birth	68	68	--	--
c. Hospital and patient status	--	--	523	523
e. Place of accident	--	--	215	215
f. Residence reporting flags	187-203	187-203	--	--

* For the unlinked file, date of birth as reported on the death certificate is used to generate age at death.

** For the unlinked file, these items are from the death certificate.

Item Location	Item Length	Variable Name, Item and Code Outline
1	1	**MATCHS** **Match Status** 1 ... Matched Birth/Infant Death Record 2 ... Surviving infant record 3 ... Unmatched infant death record Note: This code is used in the unlinked file only.
2- 6	5	**IDNUMBER** **Infant Death Number** This number uniquely identifies the same infant in the numerator and denominator-plus files.

Locations 7-210 of the linked file contain data from the Birth Certificate.
Locations 211-222, 261-535 of linked file contain data from the Death Certificate.

Residence items in the Denominator Record and in the natality section of the Numerator (linked) Record refer to the usual place of residence of the Mother; whereas in the mortality section of the Numerator (Linked) Record, these items refer to the residence of the Decedent.

7-10	4	**BIRYR** **Year of Birth** 2002 ... Born in 2002
11	1	**RESSTATB** **Resident Status - Birth** **United States Occurrence** 1 ... RESIDENTS: State and county of occurrence and residence are the same. 2 ... INTRASTATE NONRESIDENTS: State of occurrence and residence are the same, but county is different. 3 ... INTERSTATE NONRESIDENTS: State of occurrence and residence are different, but both are in the 50 States and D.C. 4 ... FOREIGN RESIDENTS: State of occurrence is one of the 50 States or the District of Columbia, but place of residence of mother is outside of the 50 States and D.C. **Puerto Rico Occurrence** 1 ... RESIDENTS: State and county of occurrence and residence are the same. 2 ... INTRASTATE NONRESIDENTS: State of occurrence and residence are the same, but county is different. 4 ... FOREIGN RESIDENTS: Occurred in Puerto Rico to a resident of any other place.

Item Location	Item Length	Variable Name, Item and Code Outline
11	1	**Virgin Islands Occurrence** 1 ... RESIDENTS: State and county of occurrence and residence are the same. 2 ... INTRASTATE NONRESIDENTS: State of occurrence and residence are the same, but county is different. 4 ... FOREIGN RESIDENTS: Occurred in the Virgin Islands to a resident of any other place. **Guam Occurrence** 1 ... RESIDENTS: Occurred in Guam to a resident of Guam or to a resident of the U.S. 4 ... FOREIGN RESIDENTS: Occurred in Guam to a resident of any place other than Guam or the U.S.
12-13	2	**BRSTATE** **Expanded State of Residence - NCHS Codes - Birth** This item is designed to separately identify New York City records from other New York State records. **United States Occurrence** 01 ... Alabama 02 ... Alaska 03 ... Arizona 04 ... Arkansas 05 ... California 06 ... Colorado 07 ... Connecticut 08 ... Delaware 09 ... District of Columbia 10 ... Florida 11 ... Georgia 12 ... Hawaii 13 ... Idaho 14 ... Illinois 15 ... Indiana 16 ... Iowa 17 ... Kansas 18 ... Kentucky 19 ... Louisiana 20 ... Maine 21 ... Maryland 22 ... Massachusetts 23 ... Michigan 24 ... Minnesota 25 ... Mississippi 26 ... Missouri

Item Location	Item Length	Variable Name, Item and Code Outline
12-13	2	**BRSTATE** **Expanded State of Residence - NCHS Codes - Birth (Cont'd)**

This item is designed to separately identify New York City records from other New York State records.

United States Occurrence

27	...	Montana
28	...	Nebraska
29	...	Nevada
30	...	New Hampshire
31	...	New Jersey
32	...	New Mexico
33	...	New York
34	...	New York City
35	...	North Carolina
36	...	North Dakota
37	...	Ohio
38	...	Oklahoma
39	...	Oregon
40	...	Pennsylvania
41	...	Rhode Island
42	...	South Carolina
43	...	South Dakota
44	...	Tennessee
45	...	Texas
46	...	Utah
47	...	Vermont
48	...	Virginia
49	...	Washington
50	...	West Virginia
51	...	Wisconsin
52	...	Wyoming
53-58,60	...	Foreign Residents
53	...	Puerto Rico
54	...	Virgin Islands
55	...	Guam
56	...	Canada
57	...	Cuba
58	...	Mexico
60	...	Remainder of the World

Puerto Rico Occurrence

53	...	Puerto Rico
01-52,54-58,60	...	Foreign Residents: Refer to U.S. for specific code structure.

Virgin Islands Occurrence

54	...	Virgin Islands
01-53,55-58,60	...	Foreign Residents: Refer to U.S. for specific code structure.

Item Location	Item Length	Variable Name, Item and Code Outline

12-13 2 **BRSTATE**
Expanded State of Residence - NCHS Codes - Birth (Cont'd)

This item is designed to separately identify New York City records from other New York State records.

Guam Occurrence

55	...	Guam
01-52	...	U.S. resident is also considered a resident of Guam.
53,54,58,60	...	Foreign Residents: Refer to U.S. for specific code structure.

14-18 5 **FIPSOCCB**
Federal Information Processing Standards (FIPS) Geographic Codes (Occurrence) - Birth

Refer to the Geographic Code Outline further back in this document for a detailed list of areas and codes. For an explanation of FIPS codes, reference should be made to various National Institute of Standards and Technology (NIST) publications.

14-15 2 **STOCCFIPB**
State of Occurrence (FIPS) - Birth

United States

01	...	Alabama
02	...	Alaska
04	...	Arizona
05	...	Arkansas
06	...	California
08	...	Colorado
09	...	Connecticut
10	...	Delaware
11	...	District of Columbia
12	...	Florida
13	...	Georgia
15	...	Hawaii
16	...	Idaho
17	...	Illinois
18	...	Indiana
19	...	Iowa
20	...	Kansas
21	...	Kentucky
22	...	Louisiana
23	...	Maine
24	...	Maryland
25	...	Massachusetts
26	...	Michigan
27	...	Minnesota
28	...	Mississippi
29	...	Missouri
30	...	Montana
31	...	Nebraska
32	...	Nevada

Item Location	Item Length	Variable Name, Item and Code Outline		
14-15	2	**STOCCFIPB**		
		State of Occurrence (FIPS) - Birth (Cont'd)		
		United States		
		33	...	New Hampshire
		34	...	New Jersey
		35	...	New Mexico
		36	...	New York
		37	...	North Carolina
		38	...	North Dakota
		39	...	Ohio
		40	...	Oklahoma
		41	...	Oregon
		42	...	Pennsylvania
		44	...	Rhode Island
		45	...	South Carolina
		46	...	South Dakota
		47	...	Tennessee
		48	...	Texas
		49	...	Utah
		50	...	Vermont
		51	...	Virginia
		53	...	Washington
		54	...	West Virginia
		55	...	Wisconsin
		56	...	Wyoming
		Puerto Rico		
		72	...	Puerto Rico
		Virgin Islands		
		78	...	Virgin Islands
		Guam		
		66	...	Guam
16-18	3	**CNTOCFIPB**		
		County of Occurrence (FIPS) - Birth		
		001-nnn	...	Counties and county equivalents (independent and coextensive cities) are numbered alphabetically within each State. (Note: To uniquely identify a county, both the State and county codes must be used.)
		999	...	County with less than 250,000 population

Item Location	Item Length	Variable Name, Item and Code Outline
19-23	5	**FIPSRESB** **Federal Information Processing Standards (FIPS) Geographic Codes (Residence) - Birth** Refer to the Geographic Code Outline further back in this document for a detailed list of areas and codes. For an explanation of FIPS codes, reference should be made to various National Institute of Standards and Technology (NIST) publications.
19-20	2	**STRESFIPB** **State of Residence (FIPS) - Birth**

United States Occurrence

00	...	Foreign residents
01	...	Alabama
02	...	Alaska
04	...	Arizona
05	...	Arkansas
06	...	California
08	...	Colorado
09	...	Connecticut
10	...	Delaware
11	...	District of Columbia
12	...	Florida
13	...	Georgia
15	...	Hawaii
16	...	Idaho
17	...	Illinois
18	...	Indiana
19	...	Iowa
20	...	Kansas
21	...	Kentucky
22	...	Louisiana
23	...	Maine
24	...	Maryland
25	...	Massachusetts
26	...	Michigan
27	...	Minnesota
28	...	Mississippi
29	...	Missouri
30	...	Montana
31	...	Nebraska
32	...	Nevada
33	...	New Hampshire
34	...	New Jersey
35	...	New Mexico
36	...	New York
37	...	North Carolina
38	...	North Dakota
39	...	Ohio
40	...	Oklahoma
41	...	Oregon
42	...	Pennsylvania
44	...	Rhode Island

Item Location	Item Length	Variable Name, Item and Code Outline

19-20 2 **STRESFIPB**
State of Residence (FIPS) - Birth Cont'd)

United States Occurrence

45	...	South Carolina
46	...	South Dakota
47	...	Tennessee
48	...	Texas
49	...	Utah
50	...	Vermont
51	...	Virginia
53	...	Washington
54	...	West Virginia
55	...	Wisconsin
56	...	Wyoming

Puerto Rico Occurrence

00-56,66,78	...	Foreign Residents: Refer to U.S. for specific code structure
72	...	Puerto Rico

Virgin Islands Occurrence

00-56,66,72	...	Foreign Residents: Refer to U.S. for specific code structure
78	...	Virgin Islands

Guam Occurrence

00,72,78	...	Foreign Residents: Refer to U.S. for specific code structure
01-56	...	U.S. Resident is also considered a resident of Guam. Refer to U.S. for specific code structure
66	...	Guam

21-23 3 **CNTYRFPB**
County of Residence (FIPS) - Birth

000	...	Foreign residents
001-nnn	...	Counties and county equivalents (independent and coextensive cities) are numbered alphabetically within each State (Note: To uniquely identify a county, both the State and county codes must be used.)
999	...	County with less than 250,000 population

24-28 5 **PLRES**
Place (City) of Residence (FIPS)

A complete list of cities is shown in the Geographic Code Outline further back in this document.

00000	...	Foreign residents
00001-nnnnn	...	Code range
99999	...	Balance of county; or city less than 250,000 population

Item Location	Item Length	Variable Name, Item and Code Outline
29	1	**MAGEFLG** **Age of Mother Flag** This position is flagged whenever age is imputed or the mother's reported age is used. The reported age is used, if valid, when computed age derived from the date of birth is not available or when it is outside the 10-49 code range. Blank ... Not imputed and reported age is not used 1 ... Reported age is used 2 ... Age is imputed
30-31	2	**DMAGE** **Age of Mother** This item is: a) computed using dates of birth of mother and of delivery; b) reported; or c) imputed. This is the age item used in NCHS publications. 10-54 ... Age in single years
32	1	**MAGER8** **Age of Mother Recode 8** 1 ... Under 15 years 2 ... 15 - 19 years 3 ... 20 - 24 years 4 ... 25 - 29 years 5 ... 30 - 34 years 6 ... 35 - 39 years 7 ... 40 - 44 years 8 ... 45 - 54 years
33	1	**ORMOTH** **Hispanic Origin of Mother** Hispanic origin is reported for all areas except Puerto Rico. 0 ... Non-Hispanic 1 ... Mexican 2 ... Puerto Rican 3 ... Cuban 4 ... Central or South American 5 ... Other and unknown Hispanic 9 ... Origin unknown or not stated

Item Location	Item Length	Variable Name, Item and Code Outline
34	1	**ORRACEM** **Hispanic Origin and Race of Mother Recode** Hispanic origin is reported for all areas except Puerto Rico. 1 ... Mexican 2 ... Puerto Rican 3 ... Cuban 4 ... Central or South American 5 ... Other and unknown Hispanic 6 ... Non-Hispanic White 7 ... Non-Hispanic Black 8 ... Non-Hispanic other races 9 ... Origin unknown or not stated
35	1	**MRACEIMP** **Race of Mother Imputation Flag** Blank ... Race is not imputed 1 ... Race is imputed 2 ... All other races, formerly code 09, is imputed
36-37	2	**MRACE** **Race of Mother - Birth Record or for Unlinked Records Race of Decedent from Death Record** Beginning with 1992 data, some areas started reporting additional Asian or Pacific Islander codes for race. Codes 18-68 replace old code 08 for these areas. Code 78 replaces old code 08 for all other areas. For consistency with Census race code 09 (all other races) used prior to 1992 has been imputed. **United States Occurrence** 01 ... White 02 ... Black 03 ... American Indian (includes Aleuts and Eskimos) 04 ... Chinese 05 ... Japanese 06 ... Hawaiian (includes part-Hawaiian) 07 ... Filipino 18 ... Asian Indian 28 ... Korean 38 ... Samoan 48 ... Vietnamese 58 ... Guamanian 68 ... Other Asian or Pacific Islander in areas reporting codes 18-58 78 ... Combined other Asian or Pacific Islander, includes codes 18-68 for areas that do not report them separately

Item Location	Item Length	Variable Name, Item and Code Outline
36-37	2	**MRACE** **Race of Mother - Birth Record or for Unlinked Records Race of Decedent from Death Record (Cont'd)**

Puerto Rico Occurrence

00	...	Other races
01	...	White
02	...	Black

Virgin Islands Occurrence

01	...	White
02	...	Black
03	...	American Indian (includes Aleuts and Eskimos)
04	...	Chinese
05	...	Japanese
06	...	Hawaiian (includes part-Hawaiian)
07	...	Filipino
08	...	Other Asian or Pacific Islander

Guam Occurrence

01	...	White
02	...	Black
03	...	American Indian (includes Aleuts and Eskimos)
04	...	Chinese
05	...	Japanese
06	...	Hawaiian (includes part-Hawaiian)
07	...	Filipino
08	...	Other Asian or Pacific Islander
58	...	Guamanian

38	1	**MRACE3** **Race of Mother Recode**

1	...	White
2	...	Races other than White or Black
3	...	Black

Item Location	Item Length	Variable Name, Item and Code Outline

39-40 2 **DMEDUC**
Education of Mother Detail

All areas report education of mother.

00	...	No formal education
01-08	...	Years of elementary school
09	...	1 year of high school
10	...	2 years of high school
11	...	3 years of high school
12	...	4 years of high school
13	...	1 year of college
14	...	2 years of college
15	...	3 years of college
16	...	4 years of college
17	...	5 or more years of college
99	...	Not stated

41 1 **MEDUC6**
Education of Mother Recode

1	...	0 - 8 years
2	...	9 - 11 years
3	...	12 years
4	...	13 - 15 years
5	...	16 years and over
6	...	Not stated

42 1 **DMARIMP**
Marital Status of Mother Imputation Flag

Blank	...	Marital status is not imputed
1	...	Marital status is imputed

43 1 **DMAR**
Marital Status of Mother

Marital status is not reported by all areas. See reporting flags.

United States/Virgin Islands/Guam Occurrence

1	...	Married
2	...	Unmarried
9	...	Unknown or not stated

Puerto Rico Occurrence

1	...	Married
2	...	Unmarried parents living together
3	...	Unmarried parents not living together
9	...	Unknown or not stated

Item Location	Item Length	Variable Name, Item and Code Outline		
44-45	2	**MPLBIR**		
		Place of Birth of Mother		
		01	...	Alabama
		02	...	Alaska
		03	...	Arizona
		04	...	Arkansas
		05	...	California
		06	...	Colorado
		07	...	Connecticut
		08	...	Delaware
		09	...	District of Columbia
		10	...	Florida
		11	...	Georgia
		12	...	Hawaii
		13	...	Idaho
		14	...	Illinois
		15	...	Indiana
		16	...	Iowa
		17	...	Kansas
		18	...	Kentucky
		19	...	Louisiana
		20	...	Maine
		21	...	Maryland
		22	...	Massachusetts
		23	...	Michigan
		24	...	Minnesota
		25	...	Mississippi
		26	...	Missouri
		27	...	Montana
		28	...	Nebraska
		29	...	Nevada
		30	...	New Hampshire
		31	...	New Jersey
		32	...	New Mexico
		33	...	New York
		34	...	North Carolina
		35	...	North Dakota
		36	...	Ohio
		37	...	Oklahoma
		38	...	Oregon
		39	...	Pennsylvania
		40	...	Rhode Island
		41	...	South Carolina
		42	...	South Dakota
		43	...	Tennessee
		44	...	Texas
		45	...	Utah
		46	...	Vermont
		47	...	Virginia
		48	...	Washington
		49	...	West Virginia

Item Location	Item Length	Variable Name, Item and Code Outline
44-45	2	**MPLBIR** **Place of Birth of Mother (Cont'd)** 50 ... Wisconsin 51 ... Wyoming 52 ... Puerto Rico 53 ... Virgin Islands 54 ... Guam 55 ... Canada 56 ... Cuba 57 ... Mexico 59 ... Remainder of the World 99 ... Not Classifiable
46	1	**MPLBIRR** **Place of Birth of Mother Recode** **United States Occurrence** 1 ... Born in the 50 States and D.C. 2 ... Born outside the 50 States and DC 3 ... Unknown or not stated **Puerto Rico/Virgin Island/ Guam Occurrence** Blank ... This item not recorded
47-48	2	**DTOTORD** **Detail Total Birth Order** Sum of live birth order and other terminations of pregnancy. If either item is unknown, this item is made unknown. 01-40 ... Total number of live births and other terminations of pregnancy 99 ... Unknown
49-50	2	**DLIVORD** **Detail Live Birth Order** Sum of live births now living and now dead plus one. If either item is unknown, this item is made unknown. 00-31 ... Number of children born alive to mother 99 ... Unknown

Item Location	Item Length	Variable Name, Item and Code Outline
51-52	2	**MONPRE** **Detail Month of Pregnancy Prenatal Care Began** 00 ... No prenatal care 01 ... 1st month 02 ... 2nd month 03 ... 3rd month 04 ... 4th month 05 ... 5th month 06 ... 6th month 07 ... 7th month 08 ... 8th month 09 ... 9th month 99 ... Unknown or not stated
53	1	**MPRE5** **Month Prenatal Care Began Recode 5** 1 ... 1st Trimester (1st-3rd month) 2 ... 2nd Trimester (4th-6th month) 3 ... 3rd Trimester (7th-9th month) 4 ... No prenatal care 5 ... Unknown or not stated
54-55	2	**NPREVIST** **Total Number of Prenatal Visits** 00 ... No prenatal visits 01-48 ... Stated number of visits 49 ... 49 or more visits 99 ... Unknown or not stated
56	1	**ADEQUACY** **Adequacy of Care Recode (Kessner Index)** This code is based on a modified Kessner criterion. Month Prenatal Care Began, Number of Prenatal Visits, and Gestation are the items used to generate this recode. 1 ... Adequate 2 ... Intermediate 3 ... Inadequate 4 ... Unknown
57-59	3	**R1** **Reserved Positions**

Item Location	Item Length	Variable Name, Item and Code Outline
60	1	**FAGERFLG** **Reported Age of Father Used Flag** This position is flagged whenever the Father's reported age in years is used. The reported age is used, if valid, when age derived from date of birth is not available or when it is less than 10. Blank ... Reported age is not used 1 ... Reported age is used
61-62	2	**DFAGE** **Age of Father** This item is either computed from date of birth of father and of child or is the reported age. This is the age item used in NCHS publications. 10-98 ... Age in single years 99 ... Unknown or not stated
63	1	**ORFATH** **Hispanic Origin of Father** Hispanic origin is reported for all areas except Puerto Rico. 0 ... Non-Hispanic 1 ... Mexican 2 ... Puerto Rican 3 ... Cuban 4 ... Central or South American 5 ... Other and unknown Hispanic 9 ... Origin unknown or not stated
64	1	**ORRACEF** **Hispanic Origin and Race of Father Recode** Hispanic origin is reported for all areas except Puerto Rico. 1 ... Mexican 2 ... Puerto Rican 3 ... Cuban 4 ... Central or South American 5 ... Other and unknown Hispanic 6 ... Non-Hispanic White 7 ... Non-Hispanic Black 8 ... Non-Hispanic other or unknown race 9 ... Origin unknown or not stated

Item Location	Item Length	Variable Name, Item and Code Outline
65-66	2	**FRACE** **Race of Father**

Beginning with 1992 data, some areas started reporting additional Asian or Pacific Islander codes for race. See reporting flags. Codes 18 -68 replace old code 08 for these areas. Code 78 replaces old code 08 for all other areas. Code 09 (all other races) has been changed to 99.

United States Occurrence

01	...	White
02	...	Black
03	...	American Indian (includes Aleuts and Eskimos)
04	...	Chinese
05	...	Japanese
06	...	Hawaiian (includes part-Hawaiian)
07	...	Filipino
18	...	Asian Indian
28	...	Korean
38	...	Samoan
48	...	Vietnamese
58	...	Guamanian
68	...	Other Asian or Pacific Islander in areas reporting codes 18-58
78	...	Combined other Asian or Pacific Islander, includes codes 18-68 for areas that do not report them separately
99	...	Unknown or not stated

Puerto Rico Occurrence

00	...	Other races
01	...	White
02	...	Black
99	...	Unknown or not stated

Virgin Islands Occurrence

01	...	White
02	...	Black
03	...	American Indian (includes Aleuts and Eskimos)
04	...	Chinese
05	...	Japanese
06	...	Hawaiian (includes part-Hawaiian)
07	...	Filipino
08	...	Other Asian or Pacific Islander
99	...	Unknown or not stated

Item Location	Item Length	Variable Name, Item and Code Outline
65-66	2	**FRACE** **Race of Father (Cont'd)** **Guam Occurrence** 01 ... White 02 ... Black 03 ... American Indian (includes Aleuts and Eskimos) 04 ... Chinese 05 ... Japanese 06 ... Hawaiian (includes part-Hawaiian) 07 ... Filipino 08 ... Other Asian or Pacific Islander 58 ... Guamanian 99 ... Unknown or not stated
67	1	**PLDEL** **Place or Facility of Delivery** 1 ... Hospital 2 ... Freestanding Birthing Center 3 ... Clinic or Doctor's Office 4 ... A Residence 5 ... Other 9 ... Unknown or Not Stated
68	1	**BIRATTND** **Attendant at Delivery** 1 ... Doctor of Medicine (M.D.) 2 ... Doctor of Osteopathy (D.O.) 3 ... Certified Nurse Midwife (C.N.M.) 4 ... Other Midwife 5 ... Other 9 ... Unknown or not stated
69	1	**R2** **Reserved position**
70	1	**GESTESTM** **Clinical Estimate of Gestation Used Flag** This position is flagged whenever the clinical estimate of gestation is used. It is used when gestation could not be computed or when the computed gestation is outside the 17-47 code range. Blank ... Clinical Estimate is not used 1 ... Clinical Estimate is used

Item Location	Item Length	Variable Name, Item and Code Outline
71-72	2	**CLINGEST** **Clinical Estimate of Gestation** Clinical estimate is not reported by all areas. See reporting flags. 17-47 ... Estimated gestation in weeks 99 ... Unknown or not stated
73	1	**GESTIMP** **Gestation Imputation Flag** Blank ... Gestation is not imputed 1 ... Gestation is imputed
74-75	2	**GESTAT** **Gestation - Detail in Weeks** This item is: a) computed using dates of birth of child and last normal menses; b) imputed from LMP date; c) the clinical estimate; or d) unknown when there is insufficient data to impute or no valid clinical estimate. This is the gestation item used in NCHS publications. 17-47 ... 17th through 47th week of gestation 99 ... Unknown
76-77	2	**GESTAT 10** **GESTATION RECODE 10** 01 ... Under 20 weeks 02 ... 20 - 27 weeks 03 ... 28 - 31 weeks 04 ... 32 - 35 weeks 05 ... 36 weeks 06 ... 37 - 39 weeks 07 ... 40 weeks 08 ... 41 weeks 09 ... 42 weeks and over 10 ... Not stated
78	1	**CSEXIMP** **Sex Imputation Flag** Blank ... Sex is not imputed 1 ... Sex is imputed
79	1	**CSEX** **Sex** 1 ... Male 2 ... Female

Item Location	Item Length	Variable Name, Item and Code Outline
80-87	8	**BIRTHWEIGHT** Beginning in 1995, an imputation for not-stated birthweight was added to reduce potential bias in the data. The following imputation flag can be used to delete imputed values for those researchers wishing to use only reported birthweight data.
80	1	**BWIF** **Birth Weight Imputation Flag** Blank ... Birthweight is not imputed 1 ... Birthweight is imputed
81-84	4	**DBIRWT** **Birth Weight Detail in Grams (Imputed)** 0227-8165 ... Number of grams 9999 ... Not stated birth weight
85-86	2	**BIRWT12** **Birth Weight Recode 12 (Imputed)** 01 ... 499 grams or less 02 ... 500-999 grams 03 ... 1000-1499 grams 04 ... 1500-1999 grams 05 ... 2000-2499 grams 06 ... 2500-2999 grams 07 ... 3000-3499 grams 08 ... 3500-3999 grams 09 ... 4000-4499 grams 10 ... 4500-4999 grams 11 ... 5000-8165 grams 12 ... Unknown or not stated
87	1	**BIRWT4** **Birth Weight Recode 4 (Imputed)** 1 ... 1499 grams or less 2 ... 1500-2499 grams 3 ... 2500 grams or more 4 ... Unknown or not stated
88	1	**PLURIMP** **Plurality Imputation Flag** Blank ... Plurality is not imputed 1 ... Plurality is imputed

Item Location	Item Length	Variable Name, Item and Code Outline
89	1	**DPLURAL** **Plurality** 1 ... Single 2 ... Twin 3 ... Triplet 4 ... Quadruplet 5 ... Quintuplet or higher
90-91	2	**FMAPS** **Five-Minute Apgar Score** Apgar score is not reported by all areas. See reporting flags. 00-10 ... A score of 0-10 99 ... Unknown or not stated
92-186	95	**MEDINFO** **Medical and Health Data** Some States do not report an entire item while other States do not report all of the categories within an item. If an item is not reported, it is indicated by code zero in the appropriate reporting flag. If a category within an item is not reported it is indicated by code 8 in the position for that category.
92-99	8	**DELMETH** **Method of Delivery** Each method is assigned a separate position, and the code structure for each method (position) is: 1 ... The method was used 2 ... The method was not used 8 ... Method not on certificate 9 ... Method unknown or not stated
92	1	**VAGINAL** **Vaginal**
93	1	**VBAC** **Vaginal Birth After Previous C-Section**
94	1	**PRIMAC** **Primary C-Section**
95	1	**REPEAC** **Repeat C-Section**
96	1	**FORCEP** **Forceps**

Item Location	Item Length	Variable Name, Item and Code Outline
97	1	**VACUUM** **Vacuum**
98	1	**R3** **Reserved Position**
99	1	**DELMETH5** **Method of Delivery Recode** 1 ... Vaginal (excludes Vaginal after previous C-section) 2 ... Vaginal birth after previous C section 3 ... Primary C-section 4 ... Repeat C-Section 5 ... Not stated
100-117	18	**MEDRISK** **Medical Risk Factors** Each risk factor is assigned a separate position, and the code structure for each risk factor (position) is: 1 ... Factor reported 2 ... Factor not reported 8 ... Factor not on certificate 9 ... Factor not classifiable
100	1	**MRFLAG** **No Medical Risk Factors Reported Flag** Blank ... One or more medical risk factors coded, one, eight, or nine 2 ... No medical risk factors reported. Each factor is coded a two.
101	1	**ANEMIA** **Anemia (Hct.<30/Hgb.<10)**
102	1	**CARDIAC** **Cardiac disease**
103	1	**LUNG** **Acute or chronic lung disease**
104	1	**DIABETES** **Diabetes**
105	1	**HERPES** **Genital herpes**
106	1	**HYDRA** **Hydramnios/Oligohydramnios**

Item Location	Item Length	Variable Name, Item and Code Outline
107	1	**HEMO** **Hemoglobinopathy**
108	1	**CHYPER** **Hypertension, chronic**
109	1	**PHYPER** **Hypertension, pregnancy-associated**
110	1	**ECLAMP** **Eclampsia**
111	1	**INCERVIX** **Incompetent cervix**
112	1	**PRE4000** **Previous infant 4000+ grams**
113	1	**PRETERM** **Previous preterm or small-for-gestational-age infant**
114	1	**RENAL** **Renal disease**
115	1	**RH** **Rh sensitization**
116	1	**UTERINE** **Uterine bleeding**
117	1	**OTHERMR** **Other Medical Risk Factors**
118-128	11	**OTHERRSK** **Other Risk Factors for this Pregnancy**
118-121	4	**TOBACRSK** **Tobacco Risks**
118	1	**TOBACCO** **Tobacco Use During Pregnancy** 1 ... Yes 2 ... No 9 ... Unknown or not stated
119-120	2	**CIGAR** **Average Number of Cigarettes Per Day** 00-97 ... As stated 98 ... 98 or more cigarettes per day 99 ... Unknown or not stated

Item Location	Item Length	Variable Name, Item and Code Outline
121	1	**CIGAR6** **Average Number of Cigarettes Per Day Recode** 0 ... Non-smoker 1 ... 1-5 cigarettes per day 2 ... 6-10 cigarettes per day 3 ... 11-20 cigarettes per day 4 ... 21-40 cigarettes per day 5 ... 41 or more cigarettes per day 6 ... Unknown or not stated
122-125	4	**ALCOHRSK** **Alcohol**
122	1	**ALCOHOL** **Alcohol Use During Pregnancy** 1 ... Yes 2 ... No 9 ... Unknown or not stated
123-124	2	**DRINK** **Average Number of Drinks Per Week** 00-97 ... As stated 98 ... 98 or more drinks per week 99 ... Unknown or not stated
125	1	**DRINK5** **Average Number of Drinks Per Week Recode** 0 ... Non-drinker 1 ... 1 drink per week 2 ... 2 drinks per week 3 ... 3-4 drinks per week 4 ... 5 or more drinks per week 5 ... Unknown or not stated
126-128	3	**WTGANRSK** **Weight Gain During Pregnancy**
126-127	2	**WTGAIN** **Weight Gain** 00-97 ... Stated number of pounds 98 ... 98 pounds or more 99 ... Unknown or not stated

Item Location	Item Length	Variable Name, Item and Code Outline
128	1	**WTGAIN9** **Weight Gain Recode** 1 ... Less than 16 pounds 2 ... 16-20 pounds 3 ... 21-25 pounds 4 ... 26-30 pounds 5 ... 31-35 pounds 6 ... 36-40 pounds 7 ... 41-45 pounds 8 ... 46 or more pounds 9 ... Unknown or not stated
129-136	8	**OBSTETRC** **Obstetric Procedures** Each procedure is assigned a separate position, and the code structure for each procedure (position) is: 1 ... Procedure reported 2 ... Procedure not reported 8 ... Procedure not on certificate 9 ... Procedure not classifiable
129	1	**OBFLAG** **Obstetric Flag** Blank ... One or more obstetric procedures coded, one, eight, or nine 2 ... No obstetric procedures reported. Each factor is coded a two.
130	1	**AMNIO** **Amniocentesis**
131	1	**MONITOR** **Electronic fetal monitoring**
132	1	**INDUCT** **Induction of labor**
133	1	**STIMULA** **Stimulation of labor**
134	1	**TOCOL** **Tocolysis**
135	1	**ULTRAS** **Ultrasound**
136	1	**OTHEROB** **Other Obstetric Procedures**

Item Location	Item Length	Variable Name, Item and Code Outline
137-153	17	**LABOR** **Complications of Labor and/or Delivery** Each complication is assigned a separate position, and the code structure for each complication (position) is: 1 ... Complication reported 2 ... Complication not reported 8 ... Complication not on certificate 9 ... Complication not classifiable
137	1	**FBFLAG** **Labor Flag** Blank ... One or more labor and/or delivery complications coded, one, eight, or nine 2 ... No labor and/or delivery complication reported. Each factor is coded a two.
138	1	**FEBRILE** **Febrile (>100 degrees F. or 38 degrees C.)**
139	1	**MECONIUM** **Meconium, moderate/heavy**
140	1	**RUPTURE** **Premature rupture of membrane (>12 hours)**
141	1	**ABRUPTIO** **Abruptio placenta**
142	1	**PREPLACE** **Placenta previa**
143	1	**EXCEBLD** **Other excessive bleeding**
144	1	**SEIZURE** **Seizures during labor**
145	1	**PRECIP** **Precipitous labor (<3 hours)**
146	1	**PROLONG** **Prolonged labor (>20 hours)**
147	1	**DYSFUNC** **Dysfunctional labor**
148	1	**BREECH** **Breech/Malpresentation**

Item Location	Item Length	Variable Name, Item and Code Outline
149	1	**CEPHALO** **Cephalopelvic disproportion**
150	1	**CORD** **Cord prolapse**
151	1	**ANESTHE** **Anesthetic complications**
152	1	**DISTRESS** **Fetal distress**
153	1	**OTHERLB** **Other Complications of Labor and/or Delivery**
154-163	10	**NEWBORN** **Abnormal conditions of the Newborn** Each condition is assigned a separate position, and the code structure for each condition (position)is: 1 ... Condition reported 2 ... Condition not reported 8 ... Condition not on certificate 9 ... Condition not classifiable
154	1	**NBFLAG** **Newborn Flag** Blank ... One or more abnormal conditions of the newborn coded, one, eight, or nine 2 ... No abnormal condition of the newborn reported. Each factor is coded a two.
155	1	**NANEMIA** **Anemia Hct.>39/Hgb.<13)**
156	1	**INJURY** **Birth injury**
157	1	**ALCOSYN** **Fetal alcohol syndrome**
158	1	**HYALINE** **Hyaline membrane disease**
159	1	**MECONSYN** **Meconium aspiration syndrome**
160	1	**VENL30** **Assisted ventilation, less than 30 minutes**

Item Location	Item Length	Variable Name, Item and Code Outline
161	1	**VEN30M** **Assisted ventilation, 30 minutes or more**
162	1	**NSEIZ** **Seizures**
163	1	**OTHERAB** **Other Abnormal Conditions of the Newborn**
164-186	23	**CONGENIT** **Congenital Anomalies** Each anomaly is assigned a separate position, and the code structure for each anomaly (position) is: 1 ... Anomaly reported 2 ... Anomaly not reported 8 ... Anomaly not on certificate 9 ... Anomaly not classifiable
164	1	**CGFLAG** **Congenital Flag** Blank ... One or more congenital anomalies coded, one, eight, or nine 2 ... No congenital anomaly is reported. Each factor is coded a two.
165	1	**ANEN** **Anencephalus**
166	1	**SPINA** **Spina bifida/Meningocele**
167	1	**HYDRO** **Hydrocephalus**
168	1	**MICROCE** **Microcephalus**
169	1	**NERVOUS** **Other central nervous system anomalies**
170	1	**HEART** **Heart malformations**
171	1	**CIRCUL** **Other circulatory/respiratory anomalies**
172	1	**RECTAL** **Rectal atresia/stenosis**

Item Location	Item Length	Variable Name, Item and Code Outline
173	1	**TRACHEO** **Tracheo-esophageal fistula/Esophageal atresia**
174	1	**OMPHALO** **Omphalocele/Gastroschisis**
175	1	**GASTRO** **Other gastrointestinal anomalies**
176	1	**GENITAL** **Malformed genitalia**
177	1	**RENALAGE** **Renal agenesis**
178	1	**UROGEN** **Other urogenital anomalies**
179	1	**CLEFTLP** **Cleft lip/palate**
180	1	**ADACTYLY** **Polydactyly/Syndactyly/Adactyly**
181	1	**CLUBFOOT** **Club foot**
182	1	**HERNIA** **Diaphragmatic hernia**
183	1	**MUSCULO** **Other musculoskeletal/integumental anomalies**
184	1	**DOWNS** **Down's syndrome**
185	1	**CHROMO** **Other chromosomal anomalies**
186	1	**OTHERCON** **Other congenital anomalies**
187-203	17	**FLRES** **Reporting Flags for Place of Residence** These positions contain flags to indicate whether or not the specified item is included on the birth certificate of the State of residence or of the SMSA of residence. The code structure of each flag (position) is: 0 ... The item is not reported 1 ... The item is reported or partially reported.

Item Location	Item Length	Variable Name, Item and Code Outline
187	1	**ORIGM** **Origin of mother**
188	1	**ORIGF** **Origin of father**
189	1	**EDUCM** **Education of mother**
190	1	**MANNER** **Manner of Death** 1...Accident 3...Homicide 4...Pending investigation 5...Could not determine 7...Natural blank...Not specified
191	1	**GESTE** **Clinical estimate of gestation**
192	1	**R5** **Reserved position**
193	1	**FMAPSRF** **5-minute Apgar score**
194	1	**DELMETRF** **Method of delivery**
195	1	**MEDRSK** **Medical risk factors**
196	1	**TOBUSE** **Tobacco use**
197	1	**ALCUSE** **Alcohol use**
198	1	**WTGN** **Weight gain**
199	1	**OBSTRC** **Obstetric procedures**
200	1	**CLABOR** **Complications of labor and/or delivery**
201	1	**ABNML** **Abnormal conditions of newborn**
202	1	**CONGAN** **Congenital anomalies**

Item Location	Item Length	Variable Name, Item and Code Outline
203	1	**API flag** **Race codes 18-68 reported (beginning with 1992 data)**
204	1	**CDOBMIMP** **Month of Birth of Child Imputation Flag** Blank ... Month is not imputed 1 ... Month is imputed
205-206	2	**BIRMON** **Month of Birth** 01 ... January 02 ... February 03 ... March 04 ... April 05 ... May 06 ... June 07 ... July 08 ... August 09 ... September 10 ... October 11 ... November 12 ... December
207-208	2	**R6** **Reserved Position**
209	1	**WEEKDAYB** **Day of Week Child Born** 1 ... Sunday 2 ... Monday 3 ... Tuesday 4 ... Wednesday 5 ... Thursday 6 ... Friday 7 ... Saturday
210	1	**R7** **Reserved Position**

Locations 211-535 contain data from the Death Certificate. Data in locations 211-222 are included on both the numerator and denominator-plus files. Data in locations 223-535 are include in the numerator file only. Residence items in the Denominator Record and in the natality section of the Numerator (Linked) Record refer to the usual place of residence of the Mother; whereas in the mortality section of the Numerator (Linked) Record, these items refer to the place of residence of the Decedent.

Item Location	Item Length	Variable Name, Item and Code Outline
211-213	3	**AGED** **Age at Death in Days** The generated age at death in days is calculated from the date of death on the death certificate minus the date of birth on the birth certificate unless the reported age of death is less than 2 days, then the reported age is used. If the exact date of birth and/or death is unknown, the age is imputed. 000-364 ... Number of days
214	1	**AGER5** **Infant Age Recode 5** 1 ... Under 1 hour 2 ... 1-23 hours 3 ... 1-6 days 4 ... 7-27 days (late neonatal) 5 ... 28 days and over (postneonatal)
215	1	**ACCIDPL** **Place of Injury for Causes W00-Y34, except Y06.- and Y07.-** Blank ... Causes other than W00-Y34, except Y06-Y07 0 ... Home 1 ... Farm 2 ... Mine and quarry 3 ... Industrial place and premises 4 ... Place for recreation and sport 5 ... Street and highway 6 ... Public building 7 ... Resident institution 8 ... Other specified places 9 ... Place of accident not specified
216-219	4	**UCOD** **ICD Code (10th Revision)** See the International Classification of Diseases, 1992 Revision, Volume 1.

Item Location	Item Length	Variable Name, Item and Code Outline
220-222	3	**UCODR130** **130 Infant Cause Recode** A recode of the ICD cause code into 130 groups for NCHS publications. Further back in this document is a complete list of recodes and the causes included. 001-158 ... Code range (not inclusive)
223-230	8	**RECWT** **Record weight** Beginning in 1995, a record weight was added to the linked file to adjust for the approximately 2-3% of infant death records each year which cannot be linked to their corresponding birth certificates. Weights are generally slightly greater than 1.0 for infant death records, and are set at 1.0 for surviving live birth records. Weights are appropriate for use in some circumstances, but not others please see Introduction for further details. The weights were used to produce all NCHS linked file tables, including Documentation tables 1-5 included in this tape documentation. The general format for the record weight is the number one followed by a decimal point and six decimal places as follows: 1.XXXXXX

Here ends the Denominator file. Documentation for the Mortality Section of the Numerator (Linked) file begins with multiple conditions in positions 261-504.

Item Location	Item Length	Variable Name, Item and Code Outline
261-504	244	**MULTCOND** **Multiple Conditions** See the International Classification of Diseases, 1992 Revision, Volume 1. Both the entity-axis and record-axis conditions are coded according to this revision (10th).
261-262	2	**EANUM** **Number of Entity-Axis Conditions** 00-20 ... Code range
263-402	140	**ENTITY** **ENTITY - AXIS CONDITIONS** Space has been provided for a maximum of 20 conditions. Each condition takes 7 positions in the record. **The 7th position will be blank.** Records that do not have 20 conditions are blank in the unused area. Position 1: Part/line number on certificate 1 ... Part I, line 1 (a) 2 ... Part I, line 2 (b) 3 ... Part I, line 3 (c) 4 ... Part I, line 4 (d) 5 ... Part I, line 5 (e) 6 ... Part II, Position 2: Sequence of condition within part/line 1-7 ... Code range Position 3 - 6: Condition code (ICD 10th Revision)
263-269	7	**1st Condition**
270-276	7	**2nd Condition**
277-283	7	**3rd Condition**
284-290	7	**4th Condition**
291-297	7	**5th Condition**

Item Location	Item Length	Variable Name, Item and Code Outline
298-304	7	**6th Condition**
305-311	7	**7th Condition**
312-318	7	**8th Condition**
319-325	7	**9th Condition**
326-332	7	**10th Condition**
333-339	7	**11th Condition**
340-346	7	**12th Condition**
347-353	7	**13th Condition**
354-360	7	**14th Condition**
361-367	7	**15th Condition**
368-374	7	**16th Condition**
375-381	7	**17th Condition**
382-388	7	**18th Condition**
389-395	7	**19th Condition**
396-402	7	**20th Condition**
403-404	2	**RANUM** **Number of Record-Axis Conditions** 00-20 ... Code range
405-504	100	**RECORD** **RECORD - AXIS CONDITIONS** Space has been provided for a maximum of 20 conditions. Each condition takes 5 positions in the record. **The 5th position will be blank.** Records that do not have 20 conditions are blank in the unused area. Positions 1-4: Condition code (ICD10th Revision) 1 ... Indicates that the code in positions 1-4 is a Nature of Injury code 0 ... All other codes

Item Location	Item Length	Variable Name, Item and Code Outline
405-409	5	**1st Condition**
410-414	5	**2nd Condition**
415-419	5	**3rd Condition**
420-424	5	**4th Condition**
425-429	5	**5th Condition**
430-434	5	**6th Condition**
435-439	5	**7th Condition**
440-444	5	**8th Condition**
445-449	5	**9th Condition**
450-454	5	**10th Condition**
455-459	5	**11th Condition**
460-464	5	**12th Condition**
465-469	5	**13th Condition**
470-474	5	**14th Condition**
475-479	5	**15th Condition**
480-484	5	**16th Condition**
485-489	5	**17th Condition**
490-494	5	**18th Condition**
495-499	5	**19th Condition**
500-504	5	**20th Condition**
505	1	**RESSTATD** **Resident Status - Death** **United States Occurrence** 1 ... RESIDENTS: State and county of occurrence and residence are the same. 2 ... INTRASTATE NONRESIDENTS: State of occurrence and residence are the same, but county is different. 3 ... INTERSTATE NONRESIDENTS: State of occurrence and residence are different, but both are in the 50 States and D.C. 4 ... FOREIGN RESIDENTS: State of occurrence is one of the 50 States or the District of Columbia, but place of residence is outside of the 50 States and D.C.

Item Location	Item Length	Variable Name, Item and Code Outline
505	1	**RESSTATD** **Resident Status - Death (Cont'd)**

Puerto Rico Occurrence

1	...	RESIDENTS: State and county of occurrence and residence are the same.
2	...	INTRASTATE NONRESIDENTS: State of occurrence and residence are the same, but county is different.
4	...	FOREIGN RESIDENTS: Occurred in Puerto Rico to a resident of any other place.

Virgin Islands Occurrence

1	...	RESIDENTS: State and county of occurrence and residence are the same.
2	...	INTRASTATE NONRESIDENTS: State of occurrence and residence are the same, but county is different.
4	...	FOREIGN RESIDENTS: Occurred in the Virgin Islands to a resident of any other place.

Guam Occurrence

1	...	RESIDENTS: Occurred in Guam to a resident of Guam or to a resident of the U.S.
4	...	FOREIGN RESIDENTS: Occurred in Guam to a resident of any place other than Guam or the U.S.

506-507 2 **DRSTATE**

Expanded State of Residence - NCHS Codes - Deaths

This item is designed to separately identify New York City records from other New York State records.

United States Occurrence

01	...	Alabama
02	...	Alaska
03	...	Arizona
04	...	Arkansas
05	...	California
06	...	Colorado
07	...	Connecticut
08	...	Delaware
09	...	District of Columbia
10	...	Florida
11	...	Georgia
12	...	Hawaii
13	...	Idaho
14	...	Illinois
15	...	Indiana
16	...	Iowa
17	...	Kansas
18	...	Kentucky
19	...	Louisiana

Item Location	Item Length	Variable Name, Item and Code Outline		
		20	...	Maine
506-507	2	**DRSTATE**		
		Expanded State of Residence - NCHS Codes - Deaths (Cont'd)		
		United States Occurrence		
		21	...	Maryland
		22	...	Massachusetts
		23	...	Michigan
		24	...	Minnesota
		25	...	Mississippi
		26	...	Missouri
		27	...	Montana
		28	...	Nebraska
		29	...	Nevada
		30	...	New Hampshire
		31	...	New Jersey
		32	...	New Mexico
		33	...	New York
		34	...	New York City
		35	...	North Carolina
		36	...	North Dakota
		37	...	Ohio
		38	...	Oklahoma
		39	...	Oregon
		40	...	Pennsylvania
		41	...	Rhode Island
		42	...	South Carolina
		43	...	South Dakota
		44	...	Tennessee
		45	...	Texas
		46	…	Utah
		47	...	Vermont
		48	...	Virginia
		49	...	Washington
		50	...	West Virginia
		51	...	Wisconsin
		52	...	Wyoming
		53-58,60	...	Foreign Residents
		53	...	Puerto Rico
		54	...	Virgin Islands
		55	...	Guam
		56	...	Canada
		57	...	Cuba
		58	...	Mexico
		60	...	Remainder of the World
		Puerto Rico Occurrence		
		53	...	Puerto Rico
		01-52,54-58,60	...	Foreign Residents: Refer to U.S. for specific code structure.

Item Location	Item Length	Variable Name, Item and Code Outline
506-507	2	**DRSTATE** **Expanded State of Residence - NCHS Codes - Deaths (Cont'd)**

Virgin Islands Occurrence

54	...	Virgin Islands
01-53,55-58,60	...	Foreign Residents: Refer to U.S. for specific code structure.

Guam Occurrence

55	...	Guam
01-52	...	U.S. resident is also considered a resident of Guam.
53,54,58,60	...	Foreign Residents: Refer to U.S. for specific code structure.

508-512 5 **FIPSOCCD**

Federal Information Processing Standards (FIPS) Geographic Codes (Occurrence) - Death

Refer to the Geographic Code Outline further back in this document for a detailed list of areas and codes. For an explanation of FIPS codes, reference should be made to various National Institute of Standards and Technology (NIST) publications.

508-509 2 **STOCCFIPD**

State of Occurrence (FIPS) - Death

United States

01	...	Alabama
02	...	Alaska
04	...	Arizona
05	...	Arkansas
06	...	California
08	...	Colorado
09	...	Connecticut
10	...	Delaware
11	...	District of Columbia
12	...	Florida
13	...	Georgia
15	...	Hawaii
16	...	Idaho
17	...	Illinois
18	...	Indiana
19	...	Iowa
20	...	Kansas
21	...	Kentucky
22	...	Louisiana
23	...	Maine
24	...	Maryland
25	...	Massachusetts
26	...	Michigan
27	...	Minnesota
28	...	Mississippi
29	...	Missouri
30	...	Montana

Item Location	Item Length	Variable Name, Item and Code Outline		
508-509	2	**STOCCFIPD** **State of Occurrence (FIPS) - Death (Cont'd)**		
		United States		
		31	...	Nebraska
		32	...	Nevada
		33	...	New Hampshire
		34	...	New Jersey
		35	...	New Mexico
		36	...	New York
		37	...	North Carolina
		38	...	North Dakota
		39	...	Ohio
		40	...	Oklahoma
		41	...	Oregon
		42	...	Pennsylvania
		44	...	Rhode Island
		45	...	South Carolina
		46	...	South Dakota
		47	...	Tennessee
		48	...	Texas
		49	...	Utah
		50	...	Vermont
		51	...	Virginia
		53	...	Washington
		54	...	West Virginia
		55	...	Wisconsin
		56	...	Wyoming
		Puerto Rico		
		72	...	Puerto Rico
		Virgin Islands		
		78	...	Virgin Islands
		Guam		
		66	...	Guam
510-512	3	**CNTOCFIPD** **County of Occurrence (FIPS) - Death**		
		001-nnn	...	Counties and county equivalents (independent and coextensive cities) are numbered alphabetically within each State. (Note: To uniquely identify a county, both the State and county codes must be used.)
		999	...	County with less than 250,000 population

Item Location	Item Length	Variable Name, Item and Code Outline
513-517	5	**FIPSRESD** **Federal Information Processing Standards (FIPS) Geographic Codes (Residence) - Death** Refer to the Geographic Code Outline further back in this document for a detailed list of areas and codes. For an explanation of FIPS codes, reference should be made to various National Institute of Standards and Technology (NIST) publications.
513-514	2	**STRESFIPD** **State of Residence (FIPS) - Death**

United States Occurrence

00	...	Foreign residents
01	...	Alabama
02	...	Alaska
04	...	Arizona
05	...	Arkansas
06	...	California
08	...	Colorado
09	...	Connecticut
10	...	Delaware
11	...	District of Columbia
12	...	Florida
13	...	Georgia
15	...	Hawaii
16	...	Idaho
17	...	Illinois
18	...	Indiana
19	...	Iowa
20	...	Kansas
21	...	Kentucky
22	...	Louisiana
23	...	Maine
24	...	Maryland
25	...	Massachusetts
26	...	Michigan
27	...	Minnesota
28	...	Mississippi
29	...	Missouri
30	...	Montana
31	...	Nebraska
32	...	Nevada
33	...	New Hampshire
34	...	New Jersey
35	...	New Mexico
36	...	New York
37	...	North Carolina
38	...	North Dakota
39	...	Ohio
40	...	Oklahoma

Item Location	Item Length	Variable Name, Item and Code Outline
513-514	2	**STRESFIPD** **State of Residence (FIPS) - Death (Cont'd)**

United States Occurrence

41	...	Oregon
42	...	Pennsylvania
44	...	Rhode Island
45	...	South Carolina
46	...	South Dakota
47	...	Tennessee
48	...	Texas
49	...	Utah
50	...	Vermont
51	...	Virginia
53	...	Washington
54	...	West Virginia
55	...	Wisconsin
56	...	Wyoming

Puerto Rico Occurrence

72	...	Puerto Rico
00-56, 66,78	...	Foreign resident: Refer to U.S. for specific code structure.

Virgin Islands Occurrence

78	...	Virgin Islands
00-56, 66,72	...	Foreign resident: Refer to U.S. for specific code structure.

Guam Occurrence

66	...	Guam
01-56, 00,72,78	...	Foreign resident: Refer to U.S. for specific code structure.

515-517	3	**CNTYRFPD** **County of Residence (FIPS) - Death**

000	...	Foreign residents
001-nnn	...	Counties and county equivalents (independent and coextensive cities) are numbered alphabetically within each State (Note: To uniquely identify a county, both the State and county codes must be used.) A complete list of counties is shown in the Geographic Code Outline further back in this document.
999	...	County with less than 250,000 population

Item Location	Item Length	Variable Name, Item and Code Outline
518-522	5	**PLRES** **Place (City) of Residence (FIPS)** A complete list of cities is shown in the Geographic code outline further back in this document. 00000 ... Foreign residents 00001-nnnnn ... Code range 99999 ... Balance of county; or city less than 250,000 population
523	1	**HOSPD** **Hospital and Patient Status** 1 ... Hospital, Clinic or Medical Center - Inpatient 2 ... Hospital, Clinic or Medical Center - Outpatient or admitted to Emergency Room 3 ... Hospital, Clinic or Medical Center - Dead on arrival 4 ... Hospital, Clinic or Medical Center - Patient status unknown 5 ... Nursing home 6 ... Residence 7 ... Other 9 ... Place of death unknown
524-527	4	**DTHYR** **Year of Death** 2002 ... Death occurred in 2002 2003 ... Death occurred in 2003
528-529	2	**DTHMON** **Month of Death** 01 ... January 02 ... February 03 ... March 04 ... April 05 ... May 06 ... June 07 ... July 08 ... August 09 ... September 10 ... October 11 ... November 12 ... December
530-531	2	**R8** **Reserved Position**

Item Location	Item Length	Variable Name, Item and Code Outline
532	1	**WEEKDAYD** **Day of Week of Death** 1 ... Sunday 2 ... Monday 3 ... Tuesday 4 ... Wednesday 5 ... Thursday 6 ... Friday 7 ... Saturday 9 ... Unknown
533-535	3	**R9** **Reserved positions**

2002 Linked Birth/Infant Death Data Set Birth Cohort

Geographic Code Outline

The following pages show the geographic codes used by the Division of Vital Statistics in the processing of vital event data occurring in the United States. For the linked data set, counties and cities with a population of 250,000 or more are identified.

Federal Information Processing Standards (FIPS) State, County, and City/Place Codes: For the 2002 birth cohort linked file, the county and city/place codes and the State code immediately preceding them are FIPS codes. These codes were effective with the 1994 data year and are based on the results of the 1990 Census. County and county equivalents (independent and coextensive cities) are numbered alphabetically within each State. When an event occurs to a nonresident of the United States, residence data are coded only to the "State" level, or to the remainder of the world. For an explanation of FIPS codes, reference should be made to various National Bureau of Standards (NBS) publications.

2002 Linked Birth/Infant Death Data Set Birth Cohort

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Listing of Counties Identified in the Linked Data Set

State	County	State and County Name
01		Alabama
	073	Jefferson
	097	Mobile
02		Alaska
04		Arizona
	013	Maricopa
	019	Pima
05		Arkansas
	119	Pulaski
06		California
	001	Alameda
	013	Contra Costa
	019	Fresno
	029	Kern
	037	Los Angeles
	053	Monterey
	059	Orange
	065	Riverside
	067	Sacramento
	071	San Bernardino
	073	San Diego
	075	San Francisco, coext. with San Francisco city
	077	San Joaquin
	081	San Mateo
	083	Santa Barbara
	085	Santa Clara
	095	Solano
	097	Sonoma
	099	Stanislaus
	107	Tulare
	111	Ventura

State	County	State and County Name
08		Colorado
	001	Adams
	005	Arapahoe
	031	Denver, coext. with Denver city
	041	El Paso
	059	Jefferson
09		Connecticut
	001	Fairfield
	003	Hartford
	009	New Haven
	011	New London
10		Delaware
	003	New Castle
11		District of Columbia
	001	District of Columbia
12		Florida
	009	Brevard
	011	Broward
	025	Dade
	031	Duval
	033	Escambia
	057	Hillsborough
	071	Lee
	095	Orange
	099	Palm Beach
	101	Pasco
	103	Pinellas
	105	Polk
	115	Sarasota
	117	Seminole
	127	Volusia
13		Georgia
	067	Cobb
	089	De Kalb
	121	Fulton
	135	Gwinnett

State	County	State and County Name
15		Hawaii
	003	Honolulu
16		Idaho
17		Illinois
	031	Cook
	043	Du Page
	089	Kane
	097	Lake
	163	St. Clair
	197	Will
	201	Winnebago
18		Indiana
	003	Allen
	089	Lake
	097	Marion
19		Iowa
	153	Polk
20		Kansas
	091	Johnson
	173	Sedgwick
21		Kentucky
	111	Jefferson
22		Louisiana
	033	East Baton Rouge
	051	Jefferson
	071	Orleans, coext. with New Orleans city
23		Maine
24		Maryland
	003	Anne Arundel
	005	Baltimore
	510	Baltimore city
	031	Montgomery

State	County	State and County Name
24		Maryland
	033	Prince George's
25		Massachusetts
	005	Bristol
	009	Essex
	013	Hampden
	017	Middlesex
	021	Norfolk
	023	Plymouth
	025	Suffolk
	027	Worcester
26		Michigan
	049	Genesee
	065	Ingham
	081	Kent
	099	Macomb
	125	Oakland
	161	Washtenaw
	163	Wayne
27		Minnesota
	037	Dakota
	053	Hennepin
	123	Ramsey
28		Mississippi
	049	Hinds
29		Missouri
	095	Jackson
	189	St. Louis
	510	St. Louis city
30		Montana
31		Nebraska
	055	Douglas

State	County	State and County Name
32		Nevada
	003	Clark
	031	Washoe
33		New Hampshire
	011	Hillsborough
34		New Jersey
	003	Bergen
	005	Burlington
	007	Camden
	013	Essex
	017	Hudson
	021	Mercer
	023	Middlesex
	025	Monmouth
	027	Morris
	029	Ocean
	031	Passaic
	039	Union
35		New Mexico
	001	Bernalillo
36		New York
	001	Albany
	027	Dutchess
	029	Erie
	055	Monroe
	059	Nassau
	085	Staten Island borough, Richmond county
	081	Queens borough, Queens county
	061	Manhattan borough, New York county
	047	Brooklyn borough, Kings county
	005	Bronx borough, Bronx county
	065	Oneida
	067	Onondaga
	071	Orange
	087	Rockland
	103	Suffolk
	119	Westchester

State	County	State and County Name
37		North Carolina
	051	Cumberland
	067	Forsyth
	081	Guilford
	119	Mecklenburg
	183	Wake
38		North Dakota
39		Ohio
	017	Butler
	035	Cuyahoga
	049	Franklin
	061	Hamilton
	093	Lorain
	095	Lucas
	099	Mahoning
	113	Montgomery
	151	Stark
	153	Summit
40		Oklahoma
	109	Oklahoma
	143	Tulsa
41		Oregon
	005	Clackamas
	039	Lane
	051	Multnomah
	067	Washington
42		Pennsylvania
	003	Allegheny
	011	Berks
	017	Bucks
	029	Chester
	045	Delaware
	049	Erie
	071	Lancaster
	077	Lehigh
	079	Luzerne

Listing of Counties Identified in the Linked Data Set

State	County	State and County Name
42		Pennsylvania
	091	Montgomery
	101	Philadelphia, coext. with Philadelphia city
	129	Westmoreland
	133	York
44		Rhode Island
	007	Providence
45		South Carolina
	019	Charleston
	045	Greenville
	079	Richland
46		South Dakota
47		Tennessee
	037	Davidson
	065	Hamilton
	093	Knox
	157	Shelby
48		Texas
	029	Bexar
	061	Cameron
	085	Collin
	113	Dallas
	121	Denton
	141	El Paso
	201	Harris
	215	Hidalgo
	355	Nueces
	439	Tarrant
	453	Travis
49		Utah
	035	Salt Lake
	049	Utah
50		Vermont

Listing of Counties Identified in the Linked Data Set

State	County	State and County Name
51		Virginia
	059	Fairfax
	710	Norfolk city
	810	Virginia Beach city
53		Washington
	033	King
	053	Pierce
	061	Snohomish
	063	Spokane
54		West Virginia
55		Wisconsin
	025	Dane
	079	Milwaukee
	133	Waukesha
56		Wyoming

Listing of Counties Identified in the Linked Data Set

State	County	State and County Name
72		Puerto Rico
	127	San Juan
78		Virgin Islands
66	010	Guam
00	000	Canada
00	000	Cuba
00	000	Mexico
00	000	Remainder of World

Listing of Cities/Places Identified in the Linked Data Set
Vital Statistics Geographic Code Outline Effective With 1998 Data

FIPS Codes		
State	City/Place	State and City/Place Name
01		Alabama
	07000	Birmingham
02		Alaska
04		Arizona
	46000	Mesa
	55000	Phoenix
	77000	Tucson
05		Arkansas
06		California
	02000	Anaheim
	27000	Fresno
	43000	Long Beach
	44000	Los Angeles
	53000	Oakland
	64000	Sacramento
	66000	San Diego
	67000	San Francisco
	68000	San Jose
	69000	Santa Ana
08		Colorado
	16000	Colorado Springs
	20000	Denver
09		Connecticut
10		Delaware
11		District of Columbia
	50000	Washington

Vital Statistics Geographic Code Outline Effective With 1998 Data

FIPS Codes State	City/Place	State and City/Place Name
12		Florida
	35000	Jacksonville
	45000	Miami
	71000	Tampa
13		Georgia
	04000	Atlanta
15		Hawaii
	17000	Honolulu
16		Idaho
17		Illinois
	14000	Chicago
18		Indiana
	36000	Indianapolis
19		Iowa
20		Kansas
	79000	Wichita
21		Kentucky
	48000	Louisville
22		Louisiana
	55000	New Orleans
23		Maine
24		Maryland
	04000	Baltimore
25		Massachusetts
	07000	Boston

Listing of Cities/Places Identified in the Linked Data Set

Vital Statistics Geographic Code Outline Effective With 1998 Data

FIPS Codes State	City/Place	State and City/Place Name
26		Michigan
	22000	Detroit
27		Minnesota
	43000	Minneapolis
	58000	St. Paul
28		Mississippi
29		Missouri
	38000	Kansas City
	65000	St. Louis
30		Montana
31		Nebraska
	37000	Omaha
32		Nevada
	40000	Las Vegas
33		New Hampshire
34		New Jersey
	51000	Newark
35		New Mexico
	02000	Albuquerque
36		New York
	51000	Bronx borough, Bronx county
	11000	Buffalo
	51000	Manhattan borough, New York county
	51000	Queens borough, Queens county
	51000	Staten Island borough, Richmond county

FIPS Codes		
State	City/Place	State and City/Place Name
37		North Carolina
	12000	Charlotte
38		North Dakota
39		Ohio
	15000	Cincinnati
	16000	Cleveland
	18000	Columbus
	77000	Toledo
40		Oklahoma
	55000	Oklahoma City
	75000	Tulsa
41		Oregon
	59000	Portland
42		Pennsylvania
	60000	Philadelphia
	61000	Pittsburgh
44		Rhode Island
45		South Carolina
46		South Dakota
47		Tennessee
	48000	Memphis
	52010	Nashville-Davidson
48		Texas
	04000	Arlington
	05000	Austin
	17000	Corpus Christi
	19000	Dallas
	24000	El Paso

Listing of Cities/Places Identified in the Linked Data Set
Vital Statistics Geographic Code Outline Effective With 1998 Data

FIPS Codes

State	City/Place	State and City/Place Name
48		Texas
	27000	Fort Worth
	35000	Houston
	65000	San Antonio
49		Utah
50		Vermont
51		Virginia
	57000	Norfolk
	82000	Virginia Beach
53		Washington
	63000	Seattle
54		West Virginia
55		Wisconsin
	53000	Milwaukee
56		Wyoming

Listing of Cities/Places Identified in the Linked Data Set
Vital Statistics Geographic Code Outline Effective With 1998 Data

FIPS Codes

State	City/Place	State and City/Place Name
72	00000	Puerto Rico
78	00000	Virgin Islands
66	00000	Guam
00	00000	Canada
00	00000	Cuba
00	00000	Mexico
00	00000	Remainder of World

ST: 1 = Subtotal Limited: Sex: 1 = Males; 2 = Females
Age: 1 = 5 and over; 2 = 10-54; 3 = 28 days and over
4 = Under 1 year; 5 = 1-4 years; 6 = 1 year and over
7 = 10 years and over

***** Cause Subtotals are not identified in this file *****

130 Recode	S T	Limited Sex	Age	Cause Title and ICD-10 Codes Included
001	1			Certain infectious and parasitic diseases (A00-B99)
002				Certain intestinal infectious diseases (A00-A08)
003				Diarrhea and gastroenteritis of infectious origin (A09)
004				Tuberculosis (A16-A19)
005				Tetanus (A33,A35)
006				Diphtheria (A36)
007				Whooping cough (A37)
008				Meningococcal infection (A39)
009			3	Septicemia (A40-A41)
010				Congenital syphilis (A50)
011				Gonococcal infection (A54)
012	1			Viral diseases (A80-B34)
013				Acute poliomyelitis (A80)
014				Varicella (chickenpox) (B01)
015				Measles (B05)
016				Human immunodeficiency virus (HIV) disease (B20-B24)
017				Mumps (B26)
018				Other and unspecified viral diseases (A81-B00,B02-B04,B06-B19,B25,B27-B34)
019				Candidiasis (B37)
020				Malaria (B50-B54)
021				Pneumocystosis (B59)
022				All other and unspecified infectious and parasitic diseases (A20-A32,A38,A42-A49,A51-A53,A55-A79,B35-B36,B38-B49,B55-B58,B60-B99)
023	1			Neoplasms (C00-D48)
024	1			Malignant neoplasms (C00-C97)
025				Hodgkin's disease and non-Hodgkin's lymphomas (C81-C85)
026				Leukemia (C91-C95)
027				Other and unspecified malignant neoplasms (C00-C80,C88,C90,C96-C97)
028				In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)
029	1			Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)
030				Anemias (D50-D64)
031				Hemorrhagic conditions and other diseases of blood and blood-forming organs (D65-D76)
032				Certain disorders involving the immune mechanism (D80-D89)
033	1			Endocrine, nutritional and metabolic diseases (E00-E88)
034				Short stature, not elsewhere classified (E34.3)
035				Nutritional deficiencies (E40-E64)
036				Cystic fibrosis (E84)
037			3	Volume depletion, disorders of fluid, electrolyte and acid-base balance (E86-E87)
038				All other endocrine, nutritional and metabolic diseases (E00-E32,E34.0-E34.2,E34.4-E34.9,E65-E83,E85,E88)
039	1			Diseases of the nervous system (G00-G98)
040				Meningitis (G00,G03)
041				Infantile spinal muscular atrophy, type I (Werdnig-Hoffman) (G12.0)
042				Infantile cerebral palsy (G80)
043				Anoxic brain damage, not elsewhere classified (G93.1)
044				Other diseases of nervous system (G04,G06-G11,G12.1-G12.9,G20-G72,G81-G92,G93.0,G93.2-G93.9,G95-G98)
045				Diseases of the ear and mastoid process (H60-H93)
046	1			Diseases of the circulatory system (I00-I99)
047				Pulmonary heart disease and diseases of pulmonary circulation (I26-I28)
048				Pericarditis, endocarditis and myocarditis (I30,I33,I40)
049				Cardiomyopathy (I42)
050				Cardiac arrest (I46)
051				Cerebrovascular diseases (I60-I69)
052				All other diseases of circulatory system (I00-I25,I31,I34-I38,I44-I45,I47-I51,I70-I99)
053	1			Diseases of the respiratory system (J00-J98)
054				Acute upper respiratory infections (J00-J06)
055	1			Influenza and pneumonia (J10-J18)

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***** Cause Subtotals are not identified in this file *****

130 Recode	S T	Limited Sex	Age	Cause Title and ICD-10 Codes Included
056				Influenza (J10-J11)
057				Pneumonia (J12-J18)
058				Acute bronchitis and acute bronchiolitis (J20-J21)
059				Bronchitis, chronic and unspecified (J40-J42)
060				Asthma (J45-J46)
061				Pneumonitis due to solids and liquids (J69)
062				Other and unspecified diseases of respiratory system (J22,J30-J39,J43-J44,J47-J68,J70-J98)
063	1			Diseases of the digestive system (K00-K92)
064				Gastritis, duodenitis, and noninfective enteritis and colitis (K29,K50-K55)
065				Hernia of abdominal cavity and intestinal obstruction without hernia (K40-K46,K56)
066				All other and unspecified diseases of digestive system (K00-K28,K30-K38,K57-K92)
067	1			Diseases of the genitourinary system (N00-N95)
068				Renal failure and other disorders of kidney (N17-N19,N25,N27)
069				Other and unspecified diseases of genitourinary system (N00-N15,N20-N23,N26,N28-N95)
070	1			Certain conditions originating in the perinatal period (P00-P96)
071	1			Newborn affected by maternal factors and by complications of pregnancy, labor and delivery (P00-P04)
072				Newborn affected by maternal hypertensive disorders (P00.0)
073				Newborn affected by other maternal conditions which may be unrelated to present pregnancy (P00.1-P00.9)
074	1			Newborn affected by maternal complications of pregnancy (P01)
075				Newborn affected by incompetent cervix (P01.0)
076				Newborn affected by premature rupture of membranes (P01.1)
077				Newborn affected by multiple pregnancy (P01.5)
078				Newborn affected by other maternal complications of pregnancy (P01.2-P01.4,P01.6-P01.9)
079	1			Newborn affected by complications of placenta, cord and membranes (P02)
080				Newborn affected by complications involving placenta (P02.0-P02.3)
081				Newborn affected by complications involving cord (P02.4-P02.6)
082				Newborn affected by chorioamnionitis (P02.7)
083				Newborn affected by other and unspecified abnormalities of membranes (P02.8-P02.9)
084				Newborn affected by other complications of labor and delivery (P03)
085				Newborn affected by noxious influences transmitted via placenta or breast milk (P04)
086	1			Disorders related to length of gestation and fetal malnutrition (P05-P08)
087				Slow fetal growth and fetal malnutrition (P05)
088	1			Disorders related to short gestation and low birthweight, not elsewhere classified (P07)
089				Extremely low birthweight or extreme immaturity (P07.0,P07.2)
090				Other low birthweight or preterm (P07.1,P07.3)
091				Disorders related to long gestation and high birthweight (P08)
092				Birth trauma (P10-P15)
093	1			Intrauterine hypoxia and birth asphyxia (P20-P21)
094				Intrauterine hypoxia (P20)
095				Birth asphyxia (P21)
096				Respiratory distress of newborn (P22)
097	1			Other respiratory conditions originating in the perinatal period (P23-P28)
098				Congenital pneumonia (P23)
099				Neonatal aspiration syndromes (P24)
100				Interstitial emphysema and related conditions originating in the perinatal period (P25)
101				Pulmonary hemorrhage originating in the perinatal period (P26)
102				Chronic respiratory disease originating in the perinatal period (P27)
103				Atelectasis (P28.0-P28.1)
104				All other respiratory conditions originating in the perinatal period (P28.2-P28.9)
105	1			Infections specific to the perinatal period (P35-P39)
106				Bacterial sepsis of newborn (P36)
107				Omphalitis of newborn with or without mild hemorrhage (P38)

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130 Recode	S T	Limited Sex	Age	Cause Title and ICD-10 Codes Included
108				All other infections specific to the perinatal period (P35,P37,P39)
109	1			Hemorrhagic and hematological disorders of newborn (P50-P61)
110				Neonatal hemorrhage (P50-P52,P54)
111				Hemorrhagic disease of newborn (P53)
112				Hemolytic disease of newborn due to isoimmunization and other perinatal jaundice (P55-P59)
113				Hematological disorders (P60-P61)
114				Syndrome of infant of a diabetic mother and neonatal diabetes mellitus (P70.0-P70.2)
115				Necrotizing enterocolitis of newborn (P77)
116				Hydrops fetalis not due to hemolytic disease (P83.2)
117				Other perinatal conditions (P29,P70.3-P70.9,P71-P76,P78-P81,P83.0-P83.1, P83.3-P83.9,P90-P96)
118	1			Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)
119				Anencephaly and similar malformations (Q00)
120				Congenital hydrocephalus (Q03)
121				Spina bifida (Q05)
122				Other congenital malformations of nervous system (Q01-Q02,Q04,Q06-Q07)
123				Congenital malformations of heart (Q20-Q24)
124				Other congenital malformations of circulatory system (Q25-Q28)
125				Congenital malformations of respiratory system (Q30-Q34)
126				Congenital malformations of digestive system (Q35-Q45)
127				Congenital malformations of genitourinary system (Q50-Q64)
128				Congenital malformations and deformations of musculoskeletal system, limbs and integument (Q65-Q85)
129				Down's syndrome (Q90)
130				Edward's syndrome (Q91.0-Q91.3)
131				Patau's syndrome (Q91.4-Q91.7)
132				Other congenital malformations and deformations (Q10-Q18,Q86-Q89)
133				Other chromosomal abnormalities, not elsewhere classified (Q92-Q99)
134	1			Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)
135				Sudden infant death syndrome (R95)
136				Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R53,R55-R94,R96-R99)
137				All other diseases (Residual) (F01-F99,H00-H57,L00-M99)
138	1			External causes of mortality (*U01,V01-Y84)
139	1			Accidents (unintentional injuries) (V01-X59)
140	1			Transport accidents (V01-V99)
141				Motor vehicle accidents(V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2, V19.4-V19.6,V20-V79,V80.3-V80.5,V81.0-V81.1,V82.0-V82.1,V83-V86, V87.0-V87.8,V88.0-V88.8,V89.0,V89.2)
142				Other and unspecified transport accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3, V19.8-V19.9,V80.0-V80.2,V80.6-V80.9,V81.2-V81.9,V82.2-V82.9, V87.9,V88.9,V89.1,V89.3,V89.9,V90-V99)
143				Falls (W00-W19)
144				Accidental discharge of firearms (W32-W34)
145				Accidental drowning and submersion (W65-W74)
146				Accidental suffocation and strangulation in bed (W75)
147				Other accidental suffocation and strangulation (W76-W77,W81-W84)
148				Accidental inhalation and ingestion of food or other objects causing obstruction of respiratory tract (W78-W80)
149				Accidents caused by exposure to smoke, fire and flames (X00-X09)
150				Accidental poisoning and exposure to noxious substances (X40-X49)
151				Other and unspecified accidents (W20-W31,W35-W64,W85-W99,X10-X39,X50-X59)
152	1			Assault (homicide) (*U01,X85-Y09)
153				Assault (homicide) by hanging, strangulation and suffocation (X91)
154				Assault (homicide) by discharge of firearms (*U01.4,X93-X95)
155				Neglect, abandonment and other maltreatment syndromes (Y06-Y07)
156				Assault (homicide) by other and unspecified means (*U01.0-*U01.3,*U01.5-*U01.9,X85-X90,X92,X96-X99,Y00-Y05,Y08-Y09)
157				Complications of medical and surgical care (Y40-Y84)

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***** Cause Subtotals are not identified in this file *****

130 Recode	S T	Limited Sex	Age	Cause Title and ICD-10 Codes Included
158				Other external causes (X60-X84,Y10-Y36)

Documentation Table 1. Live births and infant deaths by state of occurrence of birth and by state of residence at birth
United States, Puerto Rico, Virgin Islands, and Guam, 2002 Link Birth Cohort Data.

(Residence of birth is of the mother)

	Live births		Infant deaths			
			Unweighted		Weighted 1/	
State	Occurrence	Residence	Occurrence	Residence	Occurrence	Residence
United States /2	4027475	4021825	27535	27508	27827	27800
Alabama	57862	58968	523	538	525	540
Alaska	9845	9938	56	59	58	61
Arizona	87928	87837	565	563	567	565
Arkansas	36763	37437	302	308	304	310
California	530219	529372	2793	2795	2857	2859
Colorado	68537	68418	412	397	413	398
Connecticut	42658	42002	256	258	258	260
Delaware	11724	11090	104	94	104	94
Dist of Columbia	14988	7498	141	92	141	92
Florida	205680	205579	1581	1567	1585	1571
Georgia	134599	133301	1164	1170	1165	1171
Hawaii	17512	17477	127	133	127	133
Idaho	20449	20970	124	139	124	139
Illinois	177579	180622	1285	1331	1306	1352
Indiana	85506	85086	621	633	639	650
Iowa	37819	37559	195	209	196	210
Kansas	39655	39412	276	280	278	282
Kentucky	52735	54234	338	378	338	378
Louisiana	65133	64880	641	629	651	639
Maine	13372	13559	59	57	59	57
Maryland	68790	73323	513	552	516	555
Massachusetts	81698	80646	404	383	411	390
Michigan	128690	129968	1028	1039	1031	1042
Minnesota	68064	68025	364	358	364	358
Mississippi	40539	41518	399	419	402	422
Missouri	76368	75251	663	613	664	614
Montana	11018	11049	85	88	86	89
Nebraska	25515	25383	191	184	191	184
Nevada	32188	32571	207	207	207	207
New Hampshire	13943	14442	55	64	55	64
New Jersey	111813	114752	610	644	622	656
New Mexico	27351	27754	168	173	169	174
New York	129430	133121	821	826	835	839
New York City	122934	118294	691	674	691	675
North Carolina	118178	117335	955	947	957	949
North Dakota	8877	7757	48	44	48	44
Ohio	149085	148743	1201	1178	1205	1182
Oklahoma	49241	50391	397	402	415	420
Oregon	46053	45192	279	256	279	256
Pennsylvania	142992	142869	1119	1082	1123	1086
Rhode Island	13559	12894	92	88	94	90
South Carolina	52162	54570	474	497	474	497
South Dakota	11015	10698	87	78	87	78
Tennessee	82609	77482	805	714	807	716
Texas	377763	372463	2213	2214	2292	2292
Utah	50315	49183	290	270	292	272
Vermont	6107	6387	17	22	17	22
Virginia	97390	99672	719	739	721	741
Washington	78582	79031	419	435	419	435
West Virginia	21130	20712	180	186	180	186
Wisconsin	67408	68560	449	461	449	461
Wyoming	6105	6550	29	41	29	41
Foreign Residents	-	5650	-	27	-	27
Puerto Rico	52871	52747	510	506	-	-
Virgin Islands	1701	1634	5	6	-	-
Guam	3221	3212	19	19	-	-

1/ Figures are based on weighted data rounded to the nearest infant, so categories may not add to totals
2/ Excludes data for Puerto Rico, Virgin Islands and Guam.

Documentation Table 2

Live births, infant deaths, and infant mortality rates by race of mother,sex and birthweight of child: United States, 2002 birth cohort data

[Infant deaths weighted. Rates are per 1000 live births]

Race of mother and sex	Total	<500 grams	500-749 grams	750-999 grams	1000-1249 grams	1250-1499 grams	1500-1999 grams	2000-2499 grams	2500 grams or more	Not stated
All races[1]										
Both sexes										
Live births	4,021,825	6,780	11,290	11,803	13,599	15,889	61,705	193,962	3,705,556	1,241
Infant deaths	27,798	5,844	5,508	1,825	970	731	1,625	2,238	8,679	377
Infant mortality rate	6.91	861.95	487.87	154.62	71.33	46.01	26.33	11.54	2.34	303.79
Male										
Live births	2,058,037	3,428	5,790	6,112	7,073	8,002	30,072	89,335	1,907,543	682
Infant deaths	15,616	2,999	3,208	1,165	588	424	880	1,172	4,946	235
Infant mortality rate	7.59	874.85	554.06	190.61	83.13	52.99	29.26	13.12	2.59	344.57
Female										
Live births	1,963,788	3,352	5,500	5,691	6,526	7,887	31,633	104,627	1,798,013	559
Infant deaths	12,181	2,845	2,300	660	382	307	745	1,066	3,734	142
Infant mortality rate	6.20	848.75	418.18	115.97	58.54	38.92	23.55	10.19	2.08	254.03
White										
Both sexes										
Live births	3,174,807	3,873	6,690	7,370	8,937	10,699	43,113	135,691	2,957,532	902
Infant deaths	18,298	3,369	3,372	1,200	664	496	1,154	1,617	6,222	205
Infant mortality rate	5.76	869.87	504.04	162.82	74.30	46.36	26.77	11.92	2.10	227.27
Male										
Live births	1,626,328	1,950	3,497	3,875	4,697	5,422	21,122	62,993	1,522,288	484
Infant deaths	10,412	1,721	1,991	782	408	298	619	867	3,604	123
Infant mortality rate	6.40	882.56	569.35	201.81	86.86	54.96	29.31	13.76	2.37	254.13
Female										
Live births	1,548,479	1,923	3,193	3,495	4,240	5,277	21,991	72,698	1,435,244	418
Infant deaths	7,886	1,648	1,380	419	256	198	536	750	2,617	82
Infant mortality rate	5.09	856.99	432.20	119.89	60.38	37.52	24.37	10.32	1.82	196.17
Black										
Both sexes										
Live births	593,743	2,617	4,095	3,827	3,970	4,332	15,156	45,140	514,367	239
Infant deaths	8,119	2,233	1,897	535	261	197	390	494	1,960	153
Infant mortality rate	13.67	853.27	463.25	139.80	65.74	45.48	25.73	10.94	3.81	640.17
Male										
Live births	301,530	1,338	2,024	1,923	2,003	2,123	7,170	20,122	264,681	146
Infant deaths	4,430	1,157	1,080	323	149	103	211	248	1,061	99
Infant mortality rate	14.69	864.72	533.60	167.97	74.39	48.52	29.43	12.32	4.01	678.08
Female										
Live births	292,213	1,279	2,071	1,904	1,967	2,209	7,986	25,018	249,686	93
Infant deaths	3,688	1,076	817	212	112	94	178	246	899	54
Infant mortality rate	12.62	841.28	394.50	111.34	56.94	42.55	22.29	9.83	3.60	580.65

[1]/ Includes races other than white and black.

Documentation Table 3

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and gestational age:
United states, 2002 birth cohort data

[Infant deaths weighted. Rates are per 1000 live births]

Birthweight	Gestation									
	Total	<28 Weeks	28-31 Weeks	32-35 Weeks	36 Weeks	37-39 Weeks	40 Weeks	41 Weeks	42 Weeks or more	Not Stated
All races[1]										
Total										
Live births	4,021,825	29,454	48,423	224,368	178,604	2,029,752	807,896	393,914	268,096	41,318
Infant deaths	27,798	12,206	2,264	2,675	1,049	5,370	1,647	850	790	947
Infant mortality rate	6.91	414.41	46.75	11.92	5.87	2.65	2.04	2.16	2.95	22.92
Less then 2,500 grams										
Live births	315,028	28,501	37,223	106,369	36,178	80,049	11,269	5,254	6,259	3,926
Infant deaths	18,741	12,184	2,168	1,940	486	1,136	195	100	117	415
Infant mortality rate	59.49	427.49	58.24	18.24	13.43	14.19	17.30	19.03	18.69	105.71
Less then 500 grams										
Live births	6,780	6,269	263	27	1	6	5	-	3	206
Infant deaths	5,844	5,472	182	20	1	5	4	-	2	157
Infant mortality rate	861.95	872.87	692.02	740.74	*	*	*	-	*	762.14
500-749 grams										
Live births	11,290	9,516	1,351	126	3	28	7	4	10	245
Infant deaths	5,508	4,907	399	47	1	11	3	3	5	133
Infant mortality rate	487.87	515.66	295.34	373.02	*	*	*	*	*	542.86
750-999 grams										
Live births	11,803	7,084	3,865	468	22	88	37	27	20	192
Infant deaths	1,825	1,298	411	60	3	4	3	-	2	44
Infant mortality rate	154.62	183.23	106.34	128.21	*	*	*	-	*	229.17
1,000-1,249 grams										
Live births	13,599	3,091	7,376	2,134	174	396	107	51	93	177
Infant deaths	970	314	409	174	15	33	7	2	6	9
Infant mortality rate	71.33	101.59	55.45	81.54	*	83.33	*	*	*	*
1,250-1,499 grams										
Live births	15,889	963	8,280	4,965	403	681	177	80	138	202
Infant deaths	731	90	303	229	25	48	9	4	7	14
Infant mortality rate	46.01	93.46	36.59	46.12	62.03	70.48	*	*	*	*
1,500-1,999 grams										
Live births	61,705	914	11,940	33,432	4,966	7,350	1,023	464	820	796
Infant deaths	1,625	73	348	679	148	271	42	19	17	27
Infant mortality rate	26.33	79.87	29.15	20.31	29.80	36.87	41.06	*	*	33.92
2,000-2,499 grams										

Live births	193,962	664	4,148	65,217	30,609	71,500	9,913	4,628	5,175	2,108
Infant deaths	2,238	29	116	731	292	763	126	72	78	31
Infant mortality rate	11.54	43.67	27.97	11.21	9.54	10.67	12.71	15.56	15.07	14.71
2,500-2,999 grams										
Live births	688,845	953	4,084	56,979	65,536	396,613	86,437	37,110	34,321	6,812
Infant deaths	3,032	22	54	417	297	1,503	340	162	188	50
Infant mortality rate	4.40	23.08	13.22	7.32	4.53	3.79	3.93	4.37	5.48	7.34
3,000-3,499 grams										
Live births	1,522,223	-	4,674	39,630	52,906	855,357	312,610	140,353	101,931	14,762
Infant deaths	3,374	-	30	208	187	1,747	580	303	268	51
Infant mortality rate	2.22	-	6.42	5.25	3.53	2.04	1.86	2.16	2.63	3.45

See footnotes at end of table.

Documentation Table 3

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and gestational age:
United states, 2002 birth cohort data

[Infant deaths weighted. Rates are per 1000 live births]-Cont

Birthweight	Gestation									
	Total	<28 Weeks	28-31 Weeks	32-35 Weeks	36 Weeks	37-39 Weeks	40 Weeks	41 Weeks	42 Weeks or more	Not Stated
All races[1]										
3,500-3,999 grams										
Live births	1,126,215	-	2,442	17,021	19,164	545,083	292,641	148,366	90,700	10,798
Infant deaths	1,714	-	12	90	55	765	402	201	162	26
Infant mortality rate	1.52	-	*	5.29	2.87	1.40	1.37	1.35	1.79	2.41
4,000-4,499 grams										
Live births	314,255	-	-	3,742	4,025	131,541	89,904	52,638	29,256	3,149
Infant deaths	417	-	-	12	15	161	110	66	33	19
Infant mortality rate	1.33	-	-	*	*	1.22	1.22	1.25	1.13	*
4,500-4,999 grams										
Live births	48,621	-	-	524	687	18,870	13,715	9,227	5,073	525
Infant deaths	112	-	-	7	6	44	17	13	21	3
Infant mortality rate	2.30	-	-	*	*	2.33	*	*	4.14	*
5,000 grams or more										
Live births	5,397	-	-	103	108	2,239	1,320	966	556	105
Infant deaths	31	-	-	1	2	14	4	4	-	6
Infant mortality rate	5.74	-	-	*	*	*	*	*	-	*
Not stated										
Live births	1,241	-	-	-	-	-	-	-	-	1,241
Infant deaths	377	-	-	-	-	-	-	-	-	377
Infant mortality rate	303.79	-	-	-	-	-	-	-	-	303.79
White										
Total										
Live births	3,174,807	17,591	32,735	164,402	135,554	1,605,485	651,241	320,375	214,606	32,818
Infant deaths	18,298	7,339	1,487	1,918	752	3,850	1,172	622	562	595
Infant mortality rate	5.76	417.20	45.43	11.67	5.55	2.40	1.80	1.94	2.62	18.13
Less then 2,500 grams										
Live births	216,373	17,023	25,130	75,975	25,427	54,526	7,599	3,567	4,349	2,777
Infant deaths	11,872	7,326	1,421	1,386	339	823	142	72	81	281
Infant mortality rate	54.87	430.36	56.55	18.24	13.33	15.09	18.69	20.19	18.62	101.19
Less then 500 grams										
Live births	3,873	3,552	151	24	1	2	2	-	2	139
Infant deaths	3,369	3,139	103	18	1	1	1	-	1	104

Infant mortality rate	869.87	883.73	682.12	*	*	*	*	-	*	748.20
500-749 grams										
Live births	6,690	5,531	856	92	2	24	6	4	8	167
Infant deaths	3,372	2,982	248	36	1	10	3	3	4	84
Infant mortality rate	504.04	539.14	289.72	391.30	*	*	*	*	*	502.99
750-999 grams										
Live births	7,370	4,392	2,398	303	15	61	27	22	16	136
Infant deaths	1,200	854	266	41	3	3	3	-	1	29
Infant mortality rate	162.82	194.44	110.93	135.31	*	*	*	-	*	213.24
1,000-1,249 grams										
Live births	8,937	1,986	4,876	1,394	125	256	73	39	59	129
Infant deaths	664	224	269	119	10	20	7	2	4	8
Infant mortality rate	74.30	112.79	55.17	85.37	*	78.13	*	*	*	*

See footnotes at end of table.

Documentation Table 3

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and gestational age:
United states, 2002 birth cohort data

[Infant deaths weighted. Rates are per 1000 live births]-Cont

Birthweight	Gestation									
	Total	<28 Weeks	28-31 Weeks	32-35 Weeks	36 Weeks	37-39 Weeks	40 Weeks	41 Weeks	42 Weeks or more	Not Stated
White										
1,250-1,499 grams										
Live births	10,699	587	5,568	3,380	269	458	119	59	106	153
Infant deaths	496	57	208	164	16	26	7	2	6	9
Infant mortality rate	46.36	97.10	37.36	48.52	*	56.77	*	*	*	*
1,500-1,999 grams										
Live births	43,113	589	8,495	23,376	3,397	5,072	723	311	562	588
Infant deaths	1,154	49	241	488	103	200	29	11	12	20
Infant mortality rate	26.77	83.19	28.37	20.88	30.32	39.43	40.11	*	*	34.01
2,000-2,499 grams										
Live births	135,691	386	2,786	47,406	21,618	48,653	6,649	3,132	3,596	1,465
Infant deaths	1,617	21	86	519	205	563	92	53	52	26
Infant mortality rate	11.92	54.40	30.87	10.95	9.48	11.57	13.84	16.92	14.46	17.75
2,500-2,999 grams										
Live births	495,210	568	2,561	42,281	49,017	283,976	60,845	26,483	24,502	4,977
Infant deaths	2,112	13	37	303	223	1,042	225	105	126	38
Infant mortality rate	4.26	*	14.45	7.17	4.55	3.67	3.70	3.96	5.14	7.64
3,000-3,499 grams										
Live births	1,191,645	-	3,193	29,298	41,612	672,713	243,750	109,980	79,347	11,752
Infant deaths	2,378	-	21	147	139	1,229	404	222	183	32
Infant mortality rate	2.00	-	6.58	5.02	3.34	1.83	1.66	2.02	2.31	2.72
3,500-3,999 grams										
Live births	948,175	-	1,851	13,287	15,497	460,710	246,593	125,152	75,942	9,143
Infant deaths	1,305	-	7	67	38	583	304	153	131	21
Infant mortality rate	1.38	-	*	5.04	2.45	1.27	1.23	1.22	1.73	2.30
4,000-4,499 grams										
Live births	275,107	-	-	3,051	3,337	115,143	79,192	46,137	25,525	2,722
Infant deaths	316	-	-	10	9	123	80	56	24	14
Infant mortality rate	1.15	-	-	*	*	1.07	1.01	1.21	0.94	*
4,500-4,999 grams										
Live births	42,764	-	-	430	575	16,511	12,136	8,215	4,437	460
Infant deaths	88	-	-	4	4	37	13	12	16	1
Infant mortality rate	2.06	-	-	*	*	2.24	*	*	*	*
5,000 grams or more										

Live births	4,631	-	-	80	89	1,906	1,126	841	504	85
Infant deaths	22	-	-	1	-	12	3	3	-	3
Infant mortality rate	4.75	-	-	*	-	*	*	*	-	*
Not stated										
Live births	902	-	-	-	-	-	-	-	-	902
Infant deaths	205	-	-	-	-	-	-	-	-	205
Infant mortality rate	227.27	-	-	-	-	-	-	-	-	227.27
Black										
Total										
Live births	593,743	10,516	13,144	47,214	32,587	292,061	105,733	50,208	37,956	4,324
Infant deaths	8,119	4,333	686	618	244	1,214	367	180	178	298
Infant mortality rate	13.67	412.04	52.19	13.09	7.49	4.16	3.47	3.59	4.69	68.92

See footnotes at end of table.

Documentation Table 3

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and gestational age:
United states, 2002 birth cohort data

[Infant deaths weighted. Rates are per 1000 live births]-Cont

Birthweight	Gestation									
	Total	<28 Weeks	28-31 Weeks	32-35 Weeks	36 Weeks	37-39 Weeks	40 Weeks	41 Weeks	42 Weeks or more	Not Stated
Black										
Less then 2,500 grams										
Live births	79,137	10,188	10,243	24,293	8,421	19,452	2,888	1,334	1,571	747
Infant deaths	6,006	4,326	659	450	121	251	44	21	25	108
Infant mortality rate	75.89	424.62	64.34	18.52	14.37	12.90	15.24	15.74	15.91	144.58
Less then 500 grams										
Live births	2,617	2,447	105	3	-	4	3	-	1	54
Infant deaths	2,233	2,104	75	2	-	4	3	-	1	44
Infant mortality rate	853.27	859.83	714.29	*	-	*	*	-	*	814.81
500-749 grams										
Live births	4,095	3,566	432	31	1	4	-	-	2	59
Infant deaths	1,897	1,712	137	8	-	1	-	-	1	37
Infant mortality rate	463.25	480.09	317.13	*	*	*	-	-	*	627.12
750-999 grams										
Live births	3,827	2,349	1,263	134	6	18	8	5	2	42
Infant deaths	535	373	130	16	-	1	-	-	-	14
Infant mortality rate	139.80	158.79	102.93	*	*	*	*	*	*	*
1,000-1,249 grams										
Live births	3,970	960	2,150	607	45	107	30	11	31	29
Infant deaths	261	78	122	44	5	9	-	-	2	1
Infant mortality rate	65.74	81.25	56.74	72.49	*	*	-	*	*	*
1,250-1,499 grams										
Live births	4,332	333	2,259	1,320	108	188	47	19	27	31
Infant deaths	197	32	76	52	6	19	2	2	1	5
Infant mortality rate	45.48	96.10	33.64	39.39	*	*	*	*	*	*
1,500-1,999 grams										
Live births	15,156	286	2,897	8,169	1,252	1,812	255	125	221	139
Infant deaths	390	20	97	156	33	60	11	6	2	5
Infant mortality rate	25.73	69.93	33.48	19.10	26.36	33.11	*	*	*	*
2,000-2,499 grams										
Live births	45,140	247	1,137	14,029	7,009	17,319	2,545	1,174	1,287	393
Infant deaths	494	7	21	170	77	157	28	13	18	2
Infant mortality rate	10.94	*	18.47	12.12	10.99	9.07	11.00	*	*	*
2,500-2,999 grams										

Live births	140,541	328	1,259	11,523	12,515	80,332	18,353	7,836	7,450	945
Infant deaths	769	7	14	95	64	382	96	48	53	9
Infant mortality rate	5.47	*	*	8.24	5.11	4.76	5.23	6.13	7.11	*
3,000-3,499 grams										
Live births	226,502	-	1,163	8,111	8,369	124,115	46,326	20,905	16,109	1,404
Infant deaths	780	-	9	50	37	410	134	61	64	14
Infant mortality rate	3.44	-	*	6.16	4.42	3.30	2.89	2.92	3.97	*
3,500-3,999 grams										
Live births	117,810	-	479	2,729	2,699	55,662	30,188	15,268	10,024	761
Infant deaths	318	-	4	19	14	137	72	41	25	5
Infant mortality rate	2.70	-	*	*	*	2.46	2.39	2.69	2.49	*

See footnotes at end of table.

Documentation Table 3

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and gestational age:
United states, 2002 birth cohort data

[Infant deaths weighted. Rates are per 1000 live births]-Cont

Birthweight	Gestation									
	Total	<28 Weeks	28-31 Weeks	32-35 Weeks	36 Weeks	37-39 Weeks	40 Weeks	41 Weeks	42 Weeks or more	Not Stated
Black										
4,000-4,499 grams										
Live births	25,298	-	-	486	494	10,692	6,879	4,183	2,378	186
Infant deaths	72	-	-	2	5	27	19	8	7	3
Infant mortality rate	2.85	-	-	*	*	2.53	*	*	*	*
4,500-4,999 grams										
Live births	3,741	-	-	60	79	1,606	971	602	391	32
Infant deaths	14	-	-	2	1	6	-	-	3	2
Infant mortality rate	*	-	-	*	*	*	-	-	*	*
5,000 grams or more										
Live births	475	-	-	12	10	202	128	80	33	10
Infant deaths	7	-	-	-	1	2	1	-	-	3
Infant mortality rate	*	-	-	*	*	*	*	-	-	*
Not stated										
Live births	239	-	-	-	-	-	-	-	-	239
Infant deaths	153	-	-	-	-	-	-	-	-	153
Infant mortality rate	640.17	-	-	-	-	-	-	-	-	640.17

-/ Quality zero.
*/Figure does not meet standard of reliability or precision; see Technical notes.
[1]/ Includes races other then white and black.

Documentation Table 4

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and age at death: United states, 2002 birth cohort data

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 1000 live births]

Birthweight and race of mother	Live Births	Infant	Total Neonatal	Early Neonatal	Late Neonatal	Post-Neonatal
All races[1]						
Total (all birthweights)	4,021,825	27,798	18,705	14,993	3,712	9,093
Rate		6.91	4.65	3.73	0.92	2.26
Less than 2,500 grams	315,028	18,741	15,301	12,899	2,403	3,440
Rate		59.49	48.57	40.95	7.63	10.92
Less than 500 grams	6,780	5,844	5,686	5,536	150	158
Rate		861.95	838.64	816.52	22.12	23.30
500-749 grams	11,290	5,508	4,788	3,927	860	720
Rate		487.87	424.09	347.83	76.17	63.77
750-999 grams	11,803	1,825	1,368	943	426	457
Rate		154.62	115.90	79.89	36.09	38.72
1,000-1,249 grams	13,599	970	713	508	205	257
Rate		71.33	52.43	37.36	15.07	18.90
1,250-1,499 grams	15,889	731	515	384	131	217
Rate		46.01	32.41	24.17	8.24	13.66
1,500-1,999 grams	61,705	1,625	1,059	804	256	566
Rate		26.33	17.16	13.03	4.15	9.17
2,000-2,499 grams	193,962	2,238	1,172	797	375	1,065
Rate		11.54	6.04	4.11	1.93	5.49
2,500-2,999 grams	688,845	3,032	1,193	696	497	1,839
Rate		4.40	1.73	1.01	0.72	2.67
3,000-3,499 grams	1,522,223	3,374	1,078	597	482	2,295
Rate		2.22	0.71	0.39	0.32	1.51
3,500-3,999 grams	1,126,215	1,714	547	299	248	1,166
Rate		1.52	0.49	0.27	0.22	1.04
4,000-4,499 grams	314,255	417	157	101	56	260
Rate		1.33	0.50	0.32	0.18	0.83
4,500-4,999 grams	48,621	112	46	30	15	66
Rate		2.30	0.95	0.62	*	1.36
5,000 grams or more	5,397	31	18	15	3	13
Rate		5.74	*	*	*	*
Not stated	1,241	377	364	356	8	13
Rate		303.79	293.31	286.87	*	*

See footnotes at end of table.

Documentation Table 4

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and age at death: United states, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 1000 live births]

Birthweight and race of mother	Live Births	Infant	Total Neonatal	Early Neonatal	Late Neonatal	Post-Neonatal
White						
Total (all birthweights)	3,174,807	18,298	12,292	9,783	2,508	6,007
Rate		5.76	3.87	3.08	0.79	1.89
Less than 2,500 grams	216,373	11,872	9,773	8,234	1,539	2,098
Rate		54.87	45.17	38.05	7.11	9.70
Less than 500 grams	3,873	3,369	3,276	3,191	84	94
Rate		869.87	845.86	823.91	21.69	24.27
500-749 grams	6,690	3,372	3,002	2,502	500	370
Rate		504.04	448.73	373.99	74.74	55.31
750-999 grams	7,370	1,200	933	646	287	268
Rate		162.82	126.59	87.65	38.94	36.36
1,000-1,249 grams	8,937	664	518	376	142	146
Rate		74.30	57.96	42.07	15.89	16.34
1,250-1,499 grams	10,699	496	373	289	84	123
Rate		46.36	34.86	27.01	7.85	11.50
1,500-1,999 grams	43,113	1,154	788	604	183	366
Rate		26.77	18.28	14.01	4.24	8.49
2,000-2,499 grams	135,691	1,617	886	626	260	731
Rate		11.92	6.53	4.61	1.92	5.39
2,500-2,999 grams	495,210	2,112	885	532	352	1,228
Rate		4.26	1.79	1.07	0.71	2.48
3,000-3,499 grams	1,191,645	2,378	833	471	362	1,545
Rate		2.00	0.70	0.40	0.30	1.30
3,500-3,999 grams	948,175	1,305	434	240	193	872
Rate		1.38	0.46	0.25	0.20	0.92
4,000-4,499 grams	275,107	316	123	80	43	192
Rate		1.15	0.45	0.29	0.16	0.70
4,500-4,999 grams	42,764	88	34	24	10	53
Rate		2.06	0.80	0.56	*	1.24
5,000 grams or more	4,631	22	13	10	3	9
Rate		4.75	*	*	*	*
Not stated	902	205	196	191	5	9
Rate		227.27	217.29	211.75	*	*

See footnotes at end of table.

Documentation Table 4

Live births, infant deaths, and infant mortality rates by birthweight, race of mother, and age at death: United states, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 1000 live births]

Birthweight and race of mother	Live Births	Infant	Total Neonatal	Early Neonatal	Late Neonatal	Post-Neonatal
Black						
Total (all birthweights)	593,743	8,119	5,510	4,501	1,009	2,609
Rate		13.67	9.28	7.58	1.70	4.39
Less than 2,500 grams	79,137	6,006	4,820	4,078	743	1,185
Rate		75.89	60.91	51.53	9.39	14.97
Less than 500 grams	2,617	2,233	2,173	2,111	61	60
Rate		853.27	830.34	806.65	23.31	22.93
500-749 grams	4,095	1,897	1,580	1,248	332	317
Rate		463.25	385.84	304.76	81.07	77.41
750-999 grams	3,827	535	368	252	115	167
Rate		139.80	96.16	65.85	30.05	43.64
1,000-1,249 grams	3,970	261	159	107	52	102
Rate		65.74	40.05	26.95	13.10	25.69
1,250-1,499 grams	4,332	197	112	74	38	85
Rate		45.48	25.85	17.08	8.77	19.62
1,500-1,999 grams	15,156	390	214	159	54	176
Rate		25.73	14.12	10.49	3.56	11.61
2,000-2,499 grams	45,140	494	215	125	89	279
Rate		10.94	4.76	2.77	1.97	6.18
2,500-2,999 grams	140,541	769	239	125	114	530
Rate		5.47	1.70	0.89	0.81	3.77
3,000-3,499 grams	226,502	780	181	91	89	600
Rate		3.44	0.80	0.40	0.39	2.65
3,500-3,999 grams	117,810	318	85	38	47	232
Rate		2.70	0.72	0.32	0.40	1.97
4,000-4,499 grams	25,298	72	23	15	8	48
Rate		2.85	0.91	*	*	1.90
4,500-4,999 grams	3,741	14	7	3	4	7
Rate		*	*	*	*	*
5,000 grams or more	475	7	5	5	-	2
Rate		*	*	*	-	*
Not stated	239	153	149	146	3	4
Rate		640.17	623.43	610.88	*	*

See footnotes at end of table.

-/ Quality zero.
*/Figure does not meet standard of reliability or precision; see Technical notes.
[1]/ Includes races other then white and black.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Infant	Total Neonatal	Early Neonatal	Late Neonatal	Post-Neonatal
All races[1]						
All birthweights						
All causes	4,021,825	27,798	18,705	14,993	3,712	9,093
		691.18	465.09	372.79	92.30	226.09
Congenital malformations (Q00-Q99)		5,617	3,990	3,002	988	1,628
		139.66	99.21	74.64	24.57	40.48
Short gestation and low birthweight nec (P07)		4,630	4,542	4,422	119	88
		115.12	112.93	109.95	2.96	2.19
Sudden infant death syndrome (R95)		2,230	178	31	147	2,052
		55.45	4.43	0.77	3.66	51.02
Maternal complications of pregnancy (P01)		1,706	1,692	1,674	18	14
		42.42	42.07	41.62	*	*
Complications of placenta, cord, membranes (P02)		1,013	998	960	37	15
		25.19	24.81	23.87	0.92	*
Respiratory distress of newborn (P22)		937	873	704	169	64
		23.30	21.71	17.50	4.20	1.59
Accidents (unintentional injures) (V01-X59)		897	93	22	70	805
		22.30	2.31	0.55	1.74	20.02
Bacterial sepsis of newborn (P36)		765	718	331	387	46
		19.02	17.85	8.23	9.62	1.14
Deseases of the circulatory system (I00-I99)		646	231	144	87	415
		16.06	5.74	3.58	2.16	10.32
Intrauterine hypoxia, birth asphyxia (P20-P21)		576	543	426	116	33
		14.32	13.50	10.59	2.88	0.82
All other causes		8,781	4,848	3,276	1,572	3,932
		218.33	120.54	81.46	39.09	97.77
Less then 2,500 grams						
All causes	315,028	18,741	15,301	12,899	2,403	3,440
		5,949.00	4,857.03	4,094.56	762.79	1,091.97
Congenital malformations (Q00-Q99)		3,278	2,597	2,148	450	680
		1,040.54	824.37	681.84	142.84	215.85
Short gestation and low birthweight nec (P07)		4,451	4,365	4,246	119	85
		1,412.89	1,385.59	1,347.82	37.77	26.98
Sudden infant death syndrome (R95)		438	40	7	33	397
		139.04	12.70	*	10.48	126.02
Maternal complications of pregnancy (P01)		1,596	1,583	1,567	16	13
		506.62	502.50	497.42	*	*
Complications of placenta, cord, membranes (P02)		899	889	867	22	10
		285.37	282.20	275.21	6.98	*
Respiratory distress of newborn (P22)		912	853	686	167	58
		289.50	270.77	217.76	53.01	18.41
Accidents (unintentional injures) (V01-X59)		153	24	10	14	129
		48.57	7.62	*	*	40.95
Bacterial sepsis of newborn (P36)		680	640	286	354	40
		215.85	203.16	90.79	112.37	12.70
Deseases of the circulatory system (I00-I99)		285	114	76	37	171
		90.47	36.19	24.12	11.74	54.28

See footnotes at end of table.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Total Infant	Early Neonatal	Late Neonatal	Post-Neonatal
All races[1]					
Intrauterine hypoxia, birth asphyxia (P20-P21).....		311 98.72	298 94.59	246 78.09	52 16.51	13 *
All other causes.....		5,739 1,821.74	3,897 1,237.03	2,760 876.11	1,138 361.24	1,842 584.71
2,500 grams or more						
All causes 3,705,556		8,679 234.22	3,039 82.01	1,738 46.90	1,301 35.11	5,640 152.20
Congenital malformations (Q00-Q99).....		2,308 62.28	1,360 36.70	825 22.26	535 14.44	947 25.56
Short gestation and low birthweight nec (P07).....		31 0.84	30 0.81	30 0.81	- -	1 *
Sudden infant death syndrome (R95).....		1,789 48.28	138 3.72	24 0.65	114 3.08	1,651 44.55
Maternal complications of pregnancy (P01).....		32 0.86	31 0.84	29 0.78	2 *	1 *
Complications of placenta, cord, membranes (P02).....		81 2.19	77 2.08	62 1.67	15 *	4 *
Respiratory distress of newborn (P22).....		21 0.57	15 *	13 *	2 *	6 *
Accidents (unintentional injures) (V01-X59).....		744 20.08	68 1.84	12 *	56 1.51	675 18.22
Bacterial sepsis of newborn (P36).....		83 2.24	77 2.08	45 1.21	32 0.86	6 *
Deseases of the circulatory system (I00-I99).....		355 9.58	114 3.08	64 1.73	50 1.35	241 6.50
Intrauterine hypoxia, birth asphyxia (P20-P21).....		257 6.94	237 6.40	175 4.72	62 1.67	20 0.54
All other causes.....		2,978 80.37	891 24.04	458 12.36	433 11.69	2,087 56.32
Not stated birthweight						
All causes	1,241	377 30,378.73	364 29,331.18	356 28,686.54	8 *	13 *
Congenital malformations (Q00-Q99).....		32 2,578.57	32 2,578.57	29 2,336.83	3 *	- -
Short gestation and low birthweight nec (P07).....		148 11,925.87	146 11,764.71	146 11,764.71	- -	2 *
Sudden infant death syndrome (R95).....		3 *	- -	- -	- -	3 *
Maternal complications of pregnancy (P01).....		79 6,365.83	79 6,365.83	79 6,365.83	- -	- -
Complications of placenta, cord, membranes (P02).....		33 2,659.15	32 2,578.57	32 2,578.57	- -	1 *
Respiratory distress of newborn (P22).....		4 *	4 *	4 *	- -	- -
Accidents (unintentional injures) (V01-X59).....		1 *	- -	- -	- -	1 *

See footnotes at end of table.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Total Infant	Early Neonatal	Late Neonatal	Post-Neonatal
All races[1]					
Bacterial sepsis of newborn (P36).....		2	1	1	-
		*	*	*	-
Deseases of the circulatory system (I00-I99).....		6	3	-	3
		*	*	-	*
Intrauterine hypoxia, birth asphyxia (P20-P21).....		7	5	2	-
		*	*	*	-
All other causes.....		63	58	2	3
		5,076.55	4,673.65	*	*
White					
All birthweights					
All causes 3,174,807		18,298	9,783	2,508	6,007
		576.35	308.14	79.00	189.21
Congenital malformations (Q00-Q99).....		4,295	2,369	748	1,179
		135.28	74.62	23.56	37.14
Short gestation and low birthweight nec (P07).....		2,561	2,455	59	47
		80.67	77.33	1.86	1.48
Sudden infant death syndrome (R95).....		1,470	23	98	1,349
		46.30	0.72	3.09	42.49
Maternal complications of pregnancy (P01).....		1,054	1,031	15	8
		33.20	32.47	*	*
Complications of placenta, cord, membranes (P02).....		656	622	23	11
		20.66	19.59	0.72	*
Respiratory distress of newborn (P22).....		583	453	94	36
		18.36	14.27	2.96	1.13
Accidents (unintentional injures) (V01-X59).....		587	16	41	530
		18.49	*	1.29	16.69
Bacterial sepsis of newborn (P36).....		502	225	247	30
		15.81	7.09	7.78	0.94
Deseases of the circulatory system (I00-I99).....		427	99	67	261
		13.45	3.12	2.11	8.22
Intrauterine hypoxia, birth asphyxia (P20-P21).....		405	311	73	21
		12.76	9.80	2.30	0.66
All other causes.....		5,757	2,181	1,043	2,534
		181.33	68.70	32.85	79.82
Less then 2,500 grams					
All causes	216,373	11,872	8,234	1,539	2,098
		5,486.82	3,805.47	711.27	969.62
Congenital malformations (Q00-Q99).....		2,487	1,688	324	475
		1,149.40	780.13	149.74	219.53
Short gestation and low birthweight nec (P07).....		2,474	2,369	59	46
		1,143.40	1,094.87	27.27	21.26
Sudden infant death syndrome (R95).....		275	5	23	246
		127.10	*	10.63	113.69
Maternal complications of pregnancy (P01).....		991	971	13	7
		458.01	448.76	*	*

See footnotes at end of table.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Total Infant	Early Neonatal	Late Neonatal	Post-Neonatal
White					
Complications of placenta, cord, membranes (P02).....		581	572	558	14	9
		268.52	264.36	257.89	*	*
Respiratory distress of newborn (P22).....		564	533	441	93	31
		260.66	246.33	203.81	42.98	14.33
Accidents (unintentional injures) (V01-X59).....		94	16	8	8	77
		43.44	*	*	*	35.59
Bacterial sepsis of newborn (P36).....		443	417	190	226	26
		204.74	192.72	87.81	104.45	12.02
Deseases of the circulatory system (I00-I99).....		176	75	47	28	101
		81.34	34.66	21.72	12.94	46.68
Intrauterine hypoxia, birth asphyxia (P20-P21).....		201	195	167	28	6
		92.90	90.12	77.18	12.94	*
All other causes.....		3,586	2,513	1,791	723	1,073
		1,657.32	1,161.42	827.74	334.15	495.90
2,500 grams or more						
All causes	2,957,532	6,222	2,322	1,358	964	3,899
		210.38	78.51	45.92	32.59	131.83
Congenital malformations (Q00-Q99).....		1,781	1,078	655	423	704
		60.22	36.45	22.15	14.30	23.80
Short gestation and low birthweight nec (P07).....		17	17	17	-	-
		*	*	*	-	-
Sudden infant death syndrome (R95).....		1,193	92	18	74	1,100
		40.34	3.11	*	2.50	37.19
Maternal complications of pregnancy (P01).....		23	22	20	2	1
		0.78	0.74	0.68	*	*
Complications of placenta, cord, membranes (P02).....		56	54	45	9	2
		1.89	1.83	1.52	*	*
Respiratory distress of newborn (P22).....		16	11	10	1	5
		*	*	*	*	*
Accidents (unintentional injures) (V01-X59).....		494	41	8	33	453
		16.70	1.39	*	1.12	15.32
Bacterial sepsis of newborn (P36).....		59	55	34	20	4
		1.99	1.86	1.15	0.68	*
Deseases of the circulatory system (I00-I99).....		247	89	50	39	158
		8.35	3.01	1.69	1.32	5.34
Intrauterine hypoxia, birth asphyxia (P20-P21).....		199	184	140	44	15
		6.73	6.22	4.73	1.49	*
All other causes.....		2,137	679	361	318	1,458
		72.26	22.96	12.21	10.75	49.30
Not stated birthweight						
All causes	902	205	196	191	5	9
		22,727.27	21,729.49	21,175.17	*	*
Congenital malformations (Q00-Q99).....		26	26	25	1	-
		2,882.48	2,882.48	2,771.62	*	-
Short gestation and low birthweight nec (P07).....		70	69	69	-	1
		7,760.53	7,649.67	7,649.67	-	*

See footnotes at end of table.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Infant	Total Neonatal	Early Neonatal	Late Neonatal	Post-Neonatal
White						
Sudden infant death syndrome (R95)		3	-	-	-	3
		*	-	-	-	*
Maternal complications of pregnancy (P01)		40	40	40	-	-
		4,434.59	4,434.59	4,434.59	-	-
Complications of placenta, cord, membranes (P02)		19	19	19	-	-
		*	*	*	-	-
Respiratory distress of newborn (P22)		2	2	2	-	-
		*	*	*	-	-
Accidents (unintentional injures) (V01-X59)		-	-	-	-	-
		-	-	-	-	-
Bacterial sepsis of newborn (P36)		1	1	-	1	-
		*	*	-	*	-
Deseases of the circulatory system (I00-I99)		4	2	2	-	2
		*	*	*	-	*
Intrauterine hypoxia, birth asphyxia (P20-P21)		5	5	4	1	-
		*	*	*	*	-
All other causes		35	32	30	2	3
		3,880.27	3,547.67	3,325.94	*	*
Black						
All birthweights						
All causes	593,743	8,119	5,510	4,501	1,009	2,609
		1,367.43	928.01	758.07	169.94	439.42
Congenital malformations (Q00-Q99)		1,023	659	484	175	364
		172.30	110.99	81.52	29.47	61.31
Short gestation and low birthweight nec (P07)		1,860	1,823	1,769	54	36
		313.27	307.04	297.94	9.09	6.06
Sudden infant death syndrome (R95)		651	49	5	44	602
		109.64	8.25	*	7.41	101.39
Maternal complications of pregnancy (P01)		562	556	553	3	6
		94.65	93.64	93.14	*	*
Complications of placenta, cord, membranes (P02)		319	315	304	11	4
		53.73	53.05	51.20	*	*
Respiratory distress of newborn (P22)		323	298	228	69	25
		54.40	50.19	38.40	11.62	4.21
Accidents (unintentional injures) (V01-X59)		266	32	5	27	234
		44.80	5.39	*	4.55	39.41
Bacterial sepsis of newborn (P36)		238	225	96	129	13
		40.08	37.90	16.17	21.73	*
Deseases of the circulatory system (I00-I99)		173	53	37	16	121
		29.14	8.93	6.23	*	20.38
Intrauterine hypoxia, birth asphyxia (P20-P21)		139	128	97	31	11
		23.41	21.56	16.34	5.22	*
All other causes		2,565	1,371	922	449	1,193
		432.01	230.91	155.29	75.62	200.93
Less then 2,500 grams						
All causes	79,137	6,006	4,820	4,078	743	1,185
		7,589.37	6,090.70	5,153.09	938.88	1,497.40

See footnotes at end of table.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Total Infant	Early Neonatal	Late Neonatal	Post-Neonatal
Black					
Congenital malformations (Q00-Q99)		628 793.56	451 569.90	355 448.59	96 121.31	177 223.66
Short gestation and low birthweight nec (P07)		1,779 2,248.00	1,745 2,205.04	1,691 2,136.80	54 68.24	34 42.96
Sudden infant death syndrome (R95)		147 185.75	11 *	1 *	10 *	136 171.85
Maternal complications of pregnancy (P01)		520 657.09	514 649.51	511 645.72	3 *	6 *
Complications of placenta, cord, membranes (P02)		287 362.66	286 361.40	279 352.55	7 *	1 *
Respiratory distress of newborn (P22)		317 400.57	293 370.24	224 283.05	68 85.93	24 30.33
Accidents (unintentional injures) (V01-X59)		57 72.03	8 *	2 *	6 *	49 61.92
Bacterial sepsis of newborn (P36)		218 275.47	207 261.57	87 109.94	120 151.64	11 *
Deseases of the circulatory system (I00-I99)		93 117.52	35 44.23	27 34.12	8 *	57 72.03
Intrauterine hypoxia, birth asphyxia (P20-P21)		92 116.25	86 108.67	69 87.19	17 *	6 *
All other causes		1,868 2,360.46	1,185 1,497.40	831 1,050.08	354 447.33	683 863.06
2,500 grams or more						
All causes	514,367	1,960 381.05	541 105.18	277 53.85	263 51.13	1,420 276.07
Congenital malformations (Q00-Q99)		390 75.82	203 39.47	125 24.30	77 14.97	187 36.36
Short gestation and low birthweight nec (P07)		12 *	11 *	11 *	- -	1 *
Sudden infant death syndrome (R95)		504 97.98	38 7.39	4 *	34 6.61	466 90.60
Maternal complications of pregnancy (P01)		7 *	7 *	7 *	- -	- -
Complications of placenta, cord, membranes (P02)		20 3.89	18 *	14 *	4 *	2 *
Respiratory distress of newborn (P22)		4 *	3 *	2 *	1 *	1 *
Accidents (unintentional injures) (V01-X59)		207 40.24	24 4.67	3 *	21 4.08	183 35.58
Bacterial sepsis of newborn (P36)		19 *	17 *	8 *	9 *	2 *
Deseases of the circulatory system (I00-I99)		80 15.55	17 *	9 *	8 *	62 12.05
Intrauterine hypoxia, birth asphyxia (P20-P21)		45 8.75	40 7.78	27 5.25	13 *	5 *
All other causes		671 130.45	161 31.30	66 12.83	95 18.47	510 99.15

See footnotes at end of table.

Documentation Table 5

Live births by birthweight and race of mother and infant deaths and infant mortality rates by age of death, birthweight, and race of mother for 10 major causes of infant death: United States, 2002 birth cohort data -Cont

[Infant deaths are weighted. Infant deaths are under 1 year.Neonatal deaths are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Rates are per 100,000 live births]

Cause of death, birthweight, and race of mother	Live Births	Infant	Total Neonatal	Early Neonatal	Late Neonatal	Post-Neonatal
Black						
Not stated birthweight						
All causes	239	153 64,016.74	149 62,343.10	146 61,087.87	3 *	4 *
Congenital malformations (Q00-Q99)		5 *	5 *	3 *	2 *	- -
Short gestation and low birthweight nec (P07)		68 28,451.88	67 28,033.47	67 28,033.47	- -	1 *
Sudden infant death syndrome (R95)		- -	- -	- -	- -	- -
Maternal complications of pregnancy (P01)		35 14,644.35	35 14,644.35	35 14,644.35	- -	- -
Complications of placenta, cord, membranes (P02)		12 *	11 *	11 *	- -	1 *
Respiratory distress of newborn (P22)		2 *	2 *	2 *	- -	- -
Accidents (unintentional injures) (V01-X59)		1 *	- -	- -	- -	1 *
Bacterial sepsis of newborn (P36)		1 *	1 *	1 *	- -	- -
Deseases of the circulatory system (I00-I99)		1 *	- -	- -	- -	1 *
Intrauterine hypoxia, birth asphyxia (P20-P21)		2 *	2 *	1 *	1 *	- -
All other causes		25 10,460.25	25 10,460.25	25 10,460.25	- -	- -

-/ Quality zero.
*/Figure does not meet standard of reliability or precision; see Technical notes.
[1]/ Includes races other then white and black.

Documentation Table 6. Unlinked infant deaths by race, age at death, and state of residence: United States and each state, 2002
[Infant deaths are under 1 year. Neonatal death are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Data in this table is for infant deaths in 2002 that are not included in the linked file because they were not linked with their corresponding birth certificates. See methodology section. Residence is of infant decedent; race is from death certificate]

State and race of child 1/	Infant	Total neonatal	Early neonatal	Late neonatal	Postneonatal
United States /2					
Total	292	233	212	21	59
White	179	141	126	15	38
Black	93	75	69	6	18
Alabama					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	-	-	-	-	-
Alaska					
Total	6	4	2	2	2
White	-	-	-	-	-
Black	6	4	2	2	2
Arizona					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	-	-	-	-	-
Arkansas					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	3	2	1	1	1
California					
Total	64	57	54	3	7
White	46	42	39	3	4
Black	11	10	9	1	1
Colorado					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Connecticut					
Total	6	4	2	2	2
White	6	4	2	2	2
Black	-	-	-	-	-
Delaware					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Dist of Columbia					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Florida					
Total	12	8	4	4	4
White	9	6	3	3	3
Black	3	2	1	1	1
Georgia					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	-	-	-	-	-
Hawaii					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-

Documentation Table 6. Unlinked infant deaths by race, age at death, and state of residence: United States and each state, 2002
[Infant deaths are under 1 year. Neonatal death are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Data in this table is for infant deaths in 2002 that are not included in the linked file because they were not linked with their corresponding birth certificates. See methodology section. Residence is of infant decedent; race is from death certificate]

State and race of child 1/	Infant	Total neonatal	Early neonatal	Late neonatal	Postneonatal
Idaho					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Illinois					
Total	21	12	11	1	9
White	13	8	3	5	5
Black	11	7	6	1	4
Indiana					
Total	18	17	11	6	1
White	17	13	9	4	4
Black	5	4	2	2	1
Iowa					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	-	-	-	-	-
Kansas					
Total	5	3	1	2	2
White	3	2	1	1	1
Black	6	4	2	2	2
Kentucky					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	-	-	-	-	-
Louisiana					
Total	13	11	9	2	2
White	7	5	3	2	2
Black	18	12	6	6	6
Maine					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Maryland					
Total	4	3	2	1	1
White	3	2	1	1	1
Black	3	2	1	1	1
Massachusetts					
Total	10	7	4	3	3
White	8	6	4	2	2
Black	3	2	1	1	1
Michigan					
Total	9	6	3	3	3
White	3	2	1	1	1
Black	6	4	2	2	2
Minnesota					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Mississippi					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	-	-	-	-	-

Documentation Table 6. Unlinked infant deaths by race, age at death, and state of residence: United States and each state, 2002
[Infant deaths are under 1 year. Neonatal death are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Data in this table is for infant deaths in 2002 that are not included in the linked file because they were not linked with their corresponding birth certificates. See methodology section. Residence is of infant decedent; race is from death certificate]

State and race of child 1/	Infant	Total neonatal	Early neonatal	Late neonatal	Postneonatal
Missouri					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Montana					
Total	3	2	1	1	1
White	-	-	-	-	-
Black	-	-	-	-	-
Nebraska					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Nevada					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
New Hampshire					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
New Jersey					
Total	14	12	10	2	2
White	6	5	4	1	1
Black	8	7	6	1	1
New Mexico					
Total	3	2	1	1	1
White	-	-	-	-	-
Black	-	-	-	-	-
New York					
Total	7	5	4	1	2
White	5	3	2	1	2
Black	6	4	2	2	2
New York City					
Total	7	6	5	1	1
White	3	2	1	1	1
Black	9	6	3	3	3
North Carolina					
Total	3	2	1	1	1
White	3	2	1	1	1
Black	3	2	1	1	1
North Dakota					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Ohio					
Total	5	4	3	1	1
White	4	3	2	1	1
Black	3	2	1	1	1
Oklahoma					
Total	20	16	14	2	4
White	10	7	4	3	3
Black	10	8	6	2	2

Documentation Table 6. Unlinked infant deaths by race, age at death, and state of residence: United States and each state, 2002
[Infant deaths are under 1 year. Neonatal death are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Data in this table is for infant deaths in 2002 that are not included in the linked file because they were not linked with their corresponding birth certificates. See methodology section. Residence is of infant decedent; race is from death certificate]

State and race of child 1/	Infant	Total neonatal	Early neonatal	Late neonatal	Postneonatal
Oregon					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Pennsylvania					
Total	5	4	3	1	1
White	3	2	1	1	1
Black	6	4	2	2	2
Rhode Island					
Total	6	4	2	2	2
White	6	4	2	2	2
Black	-	-	-	-	-
South Carolina					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
South Dakota					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Tennessee					
Total	3	2	1	1	1
White	-	-	-	-	-
Black	3	2	1	1	1
Texas					
Total	79	74	70	4	5
White	53	51	47	4	2
Black	27	24	21	3	3
Utah					
Total	3	2	1	1	1
White	-	-	-	-	-
Black	3	2	1	1	1
Vermont					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Virginia					
Total	6	4	2	2	2
White	6	4	2	2	2
Black	-	-	-	-	-
Washington					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
West Virginia					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Wisconsin					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-

Documentation Table 6. Unlinked infant deaths by race, age at death, and state of residence: United States and each state, 2002
[Infant deaths are under 1 year. Neonatal death are under 28 days; early neonatal, 0-6 days; late neonatal, 7-27 days; and postneonatal, 28 days through 11 months. Data in this table is for infant deaths in 2002 that are not included in the linked file because they were not linked with their corresponding birth certificates. See methodology section. Residence is of infant decedent; race is from death certificate]

State and race of child 1/	Infant	Total neonatal	Early neonatal	Late neonatal	Postneonatal
Wyoming					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Puerto Rico					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-
Virgin Islands					
Total	7	4	1	3	3
White	5	3	1	2	2
Black	3	2	1	1	1
Guam					
Total	-	-	-	-	-
White	-	-	-	-	-
Black	-	-	-	-	-

1/ Totals for geographic areas include races other than white and black.
2/ Excludes data for foreign residents, Puerto Rico, Virgin Islands and Guam.
3/ Data from the Puerto Rico, Virgin Islands, and Guam file

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Infant Mortality Statistics from the 2002 Period Linked Birth/Infant Death Data Set

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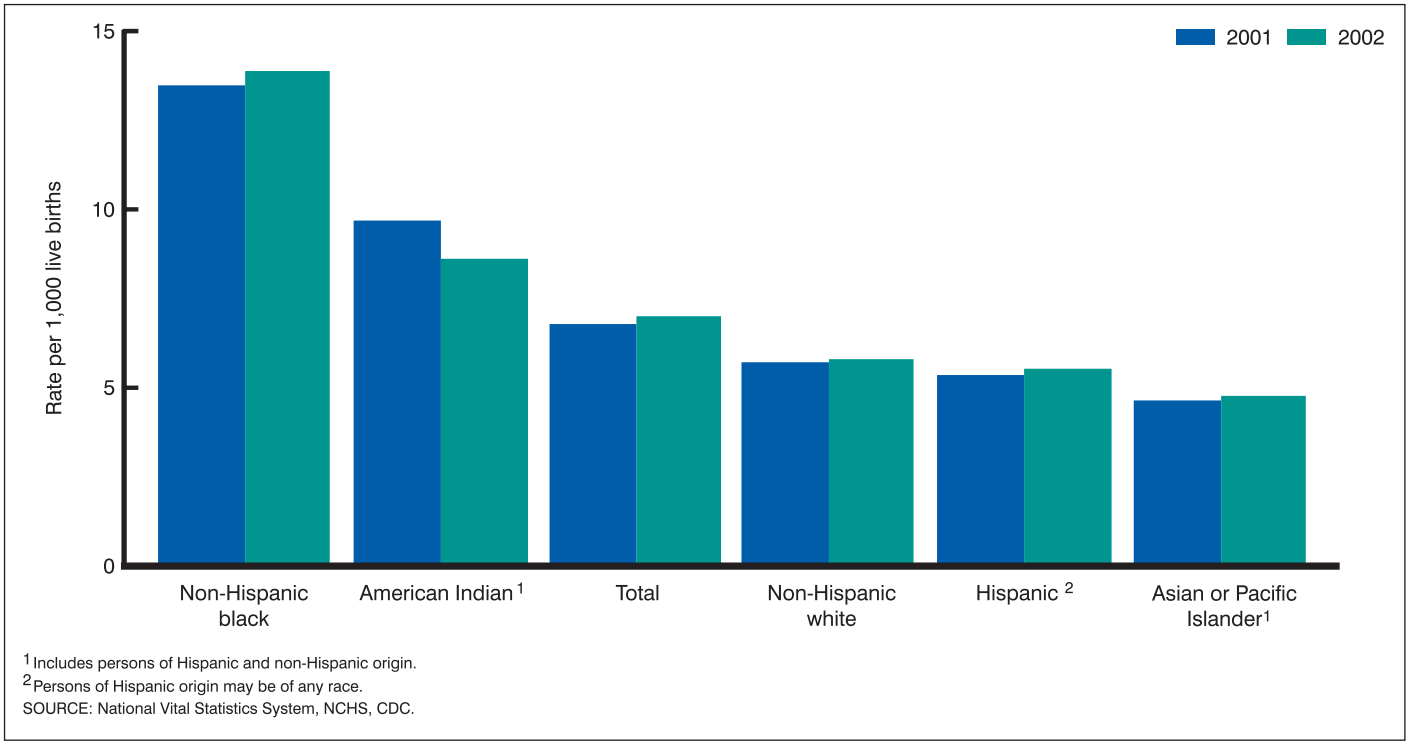
Abstract

Objectives—This report presents 2002 period infant mortality statistics from the linked birth/infant death data file by a variety of maternal and infant characteristics. The linked file differs from the mortality file, which is based entirely on death certificate data.

Methods—Descriptive tabulations of data are presented and interpreted.

Results—The U.S. infant mortality rate increased from 6.8 infant deaths per 1,000 live births in 2001 to 7.0 in 2002. The rate for infants of non-Hispanic white mothers was 5.7 in 2001 compared with 5.8 in 2002. The rate for infants of non-Hispanic black mothers was 13.5 in 2001 compared with 13.9 in 2002. Neither of the changes for non-Hispanic white nor non-Hispanic black was significant. Between 2001 and 2002, overall cause-specific rates increased 5 percent for low birthweight and 14 percent for maternal complications. The rate rose significantly for infants of mothers who smoked, 10.5 to 11.1. It also increased significantly from 10.7 to 11.5 for infants of mothers aged 15–17 years. The rate dropped significantly for triplet births, 71.4 to 60.1. Infant mortality rates ranged from 3.0 per 1,000 live births for Chinese mothers to 13.9 for non-Hispanic black mothers. Among Hispanics, rates ranged from 3.7 for Cuban mothers to 8.2 for Puerto Rican mothers. Infant mortality rates were higher for those infants



1 Includes persons of Hispanic and non-Hispanic origin.
2 Persons of Hispanic origin may be of any race.
SOURCE: National Vital Statistics System, NCHS, CDC.

Figure 1. Infant mortality rates by race and ethnicity, 2001 and 2002

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CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL VITAL STATISTICS SYSTEM

whose mothers were born in the 50 States and the District of Columbia, were unmarried, or smoked during pregnancy. Infant mortality was also higher for male infants, multiple births, and infants born preterm or at low birthweight. The three leading causes of infant death—Congenital malformations, low birthweight, and Sudden infant death syndrome (SIDS)—taken together accounted for 45 percent of all infant deaths. For infants of non-Hispanic black mothers, the cause-specific infant mortality rate for low birthweight was nearly four times that for infants of non-Hispanic white mothers. For infants of non-Hispanic black and American Indian mothers, the SIDS rates were at least double the rate for non-Hispanic white mothers. A more intensive analysis of the rise in the infant mortality rate utilizing information on maternal and infant health risk factors available in the linked birth/infant death and fetal death data files is forthcoming.

Keywords: infant mortality • infant health • birthweight • maternal characteristics

Introduction

This report presents infant mortality data from the 2002 period linked file. In the linked file, the information from the death certificate is linked to information from the birth certificate for each infant under 1 year of age who died in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, or Guam during 2002. Linked birth/infant death data are not available for American Samoa and the Commonwealth of the Northern Marianas. The purpose of the linkage is to use the many additional variables available from the birth certificate to conduct more detailed analyses of infant mortality patterns. This report presents infant mortality data by race and Hispanic origin of the mother, birthweight, period of gestation, sex of infant, plurality, trimester of pregnancy prenatal care began, maternal age, maternal educational attainment, live-birth order, mother's marital status, mother's place of birth, maternal smoking during pregnancy, age at death, and underlying cause of death (tables 1–7, A–D, and figures 1 and 2). Other variables available in the linked file data set (1), but which are not discussed in this report include: father's age, race, and Hispanic origin; birth attendant; place of delivery; mother's weight gain during pregnancy; and many medical and health measurements. Another report, based on data from the vital statistics mortality file, provides more detailed information on trends in infant mortality and on causes of infant death (2). Some rates calculated from the mortality file differ from those published using the linked birth/infant death file (linked file). The linked file is used for analysis and for calculating infant mortality rates by race and ethnicity that are more accurately measured from the birth certificate. A more detailed discussion of the differences in the number of infant deaths and infant mortality rates between the linked file and the mortality file is presented in the "Technical Notes."

Methods

Data shown in this report are based on birth and infant death certificates registered in all States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. As part of the Vital Statistics Cooperative Program, each State provided to the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS) matching birth and death certificate numbers for each infant under 1 year of age who died in the State during 2002. When the birth and death occurred in different States, the State of death was responsible for contacting the State of birth identified on the death certificate to obtain the original birth certificate number. NCHS used the matching birth and death certificate numbers provided by the States to extract final edited data from the NCHS natality and mortality statistical files. These data were linked to form a single statistical record, thereby establishing a national linked record file.

After the initial linkage, NCHS returned computer lists of unlinked infant death records and records with inconsistent data between the birth and death certificates to each State. State additions and corrections were incorporated, and a final national linked file was produced. In 2002, 99.0 percent of all infant death records were successfully matched to their corresponding birth records. This is higher than in 2001 (98.9). A record weight was added to the linked file in 2002 to compensate for the 1.0 percent of infant death records that were not linked to their corresponding birth certificates. See the "Technical Notes" for more information on the weighting of the linked file.

Information on births by age, race, or marital status of mother is imputed if it is not reported on the birth certificate. These items were not reported for less than 1 percent of U.S. births in 2002 (3).

Table A. Infant, neonatal, and postneonatal deaths and mortality rates by specified race or national origin of mother: United States, 2002 linked file

Race of mother	Live births	Number of deaths			Mortality rate per 1,000 live births		
		Infant	Neonatal	Postneonatal	Infant	Neonatal	Postneonatal
All races	4,021,825	27,970	18,791	9,179	7.0	4.7	2.3
White	3,174,807	18,395	12,352	6,044	5.8	3.9	1.9
Black	593,743	8,201	5,533	2,668	13.8	9.3	4.5
American Indian[1]	42,367	366	195	171	8.6	4.6	4.0
Asian or Pacific Islander	210,908	1,006	710	296	4.8	3.4	1.4
Chinese	33,673	101	79	22	3.0	2.4	0.7
Japanese	9,264	45	34	11	4.9	3.7	*
Hawaiian	6,772	65	38	27	9.6	5.6	4.0
Filipino	33,016	190	134	55	5.7	4.1	1.7
Other Asian or Pacific Islander	128,183	605	424	181	4.7	3.3	1.4

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.
[1]Includes Aleuts and Eskimos.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. Neonatal is less than 28 days, and postneonatal is 28 days to under 1 year.

Table B. Infant, neonatal, and postneonatal deaths and mortality rates by Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: United States, 2002 linked file

Hispanic origin and race of mother	Live births	Number of deaths			Mortality rate per 1,000 live births		
		Infant	Neonatal	Postneonatal	Infant	Neonatal	Postneonatal
All origins[1]	4,021,825	27,970	18,791	9,179	7.0	4.7	2.3
Total Hispanic	876,654	4,927	3,360	1,567	5.6	3.8	1.8
Mexican	627,510	3,399	2,283	1,116	5.4	3.6	1.8
Puerto Rican	57,469	471	334	137	8.2	5.8	2.4
Cuban	14,232	53	46	7	3.7	3.2	*
Central and South American	125,984	637	435	202	5.1	3.5	1.6
Other and unknown Hispanic	51,459	368	263	105	7.1	5.1	2.0
Non-Hispanic total[2]	3,119,987	22,647	15,109	7,538	7.3	4.8	2.4
Non-Hispanic white	2,298,168	13,327	8,853	4,474	5.8	3.9	1.9
Non-Hispanic black	578,366	8,031	5,399	2,632	13.9	9.3	4.6
Not stated	25,184	395	322	74	. . .	. . .	. . .

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.
. . . Category not applicable.
[1]Origin of mother not stated included in "All origins" but not distributed among origins.
[2]Includes races other than white or black.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. Neonatal is less than 28 days, and postneonatal is 28 days to under 1 year.

Table C. Infant, neonatal, and postneonatal deaths and mortality rates by race or national origin of mother: Total of 11 States, 2002 linked file

Race of mother	Live births	Number of deaths			Mortality rate per 1,000 live births		
		Infant	Neonatal	Postneonatal	Infant	Neonatal	Postneonatal
All races	1,808,792	11,232	7,501	3,731	6.2	4.1	2.1
Total Asian or Pacific Islander	147,907	674	453	221	4.6	3.1	1.5
Chinese	26,727	83	63	20	3.1	2.4	0.8
Japanese	7,251	35	24	11	4.9	3.4	*
Filipino	26,982	158	111	46	5.8	4.1	1.7
Vietnamese	16,211	60	47	13	3.7	2.9	*
Asian Indian	28,532	105	71	34	3.7	2.5	1.2
Korean	10,430	38	23	15	3.7	2.2	*
Hawaiian	5,931	55	34	21	9.3	5.7	3.5
Samoan	1,616	11	5	6	*	*	*
Guamanian	529	8	2	6	*	*	*
Remaining Asian or Pacific Islander	23,698	119	71	48	5.0	3.0	2.0
White	1,433,745	7,687	5,155	2,532	5.4	3.6	1.8
Black	218,206	2,789	1,855	934	12.8	8.5	4.3
American Indian[1]	8,934	82	37	44	9.1	4.2	4.9

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.
[1]Includes Aleuts and Eskimos.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. States included are California, Hawaii, Illinois, Minnesota, Missouri, New Jersey, New York, Texas, Virginia, Washington, and West Virginia. Neonatal is less than 28 days, and postneonatal is 28 days to under 1 year.

Race and Hispanic origin are reported independently on the birth certificate. In tabulations of birth data by race and Hispanic origin, data for Hispanic persons are not further classified by race as the vast majority of women of Hispanic origin are reported as white. Data for American Indian and Asian or Pacific Islander (API) births are not shown separately by Hispanic origin because the vast majority of these populations are non-Hispanic.

Starting with data year 1999 cause-of-death statistics in this and similar publications are classified in accordance with the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (ICD–10) (4). Issues of this report for data years previous to 1999 included causes of death classified according to the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, Ninth Revision* (ICD-9) (5). Issues related to comparability between ICD revisions are discussed in the "Technical Notes."

Data by maternal and infant characteristics

This report presents descriptive tabulations of infant mortality data by a variety of maternal and infant characteristics. These tabulations are useful for understanding the basic relationships between risk factors and infant mortality, *unadjusted for the possible effects of other variables*. In reality, women with one risk factor often have other risk factors as well. For example, teenage mothers are more likely to also be unmarried and of a low-income status, and mothers who do not receive prenatal care are more likely to be of a low-income status and uninsured. The preferred method for disentangling the multiple interrelationships among risk factors is multivariate analysis; however, an understanding of the basic relationships

Table D. Infant mortality rates by race and Hispanic origin of mother: United States, 1995–2002 linked files

Race and Hispanic origin of mother	1995	1996	1997	1998	1999	2000	2001	2002	Percent change 1995 to 2002	Percent change 2001 to 2002
All races	7.6	7.3	7.2	7.2	7.0	6.9	6.8	7.0	–7.9	2.9
White	6.3	6.1	6.0	6.0	5.8	5.7	5.7	5.8	–7.9	1.8**
Black	14.6	14.1	13.7	13.8	14.0	13.5	13.3	13.8	–5.5	3.8
American Indian[1]	9.0	10.0	8.7	9.3	9.3	8.3	9.7	8.6	–4.4**	–11.3**
Asian or Pacific Islander	5.3	5.2	5.0	5.5	4.8	4.9	4.7	4.8	–9.4	2.1**
Chinese	3.8	3.2	3.1	4.0	2.9	3.5	3.2	3.0	–21.1**	–6.3**
Japanese	5.3	4.2	5.3	3.5	3.4	4.5	4.0	4.9	–7.5**	22.5**
Hawaiian	6.6	5.6	9.0	10.0	7.1	9.0	7.3	9.6	45.5**	31.5**
Filipino	5.6	5.8	5.8	6.2	5.8	5.7	5.5	5.7	1.8**	3.6**
Hispanic	6.3	6.1	6.0	5.8	5.7	5.6	5.4	5.6	–11.1	3.7**
Mexican	6.0	5.8	5.8	5.6	5.5	5.4	5.2	5.4	–10.0	3.8**
Puerto Rican	8.9	8.6	7.9	7.8	8.3	8.2	8.5	8.2	–7.9**	–3.5**
Cuban	5.3	5.1	5.5	3.6	4.7	4.6	4.2	3.7	–30.2**	–11.9**
Central and South American	5.5	5.0	5.5	5.3	4.7	4.6	5.0	5.1	–7.3**	2.0**
Non-Hispanic white	6.3	6.0	6.0	6.0	5.8	5.7	5.7	5.8	–7.9	1.8**
Non-Hispanic black	14.7	14.2	13.7	13.9	14.1	13.6	13.5	13.9	–5.4	3.0**

** Not significant at $p<.05$.
[1]Includes Aleuts and Eskimos.

between risk factors and infant mortality is a necessary precursor to more sophisticated types of analyses and is the aim of this publication.

Race and Hispanic origin data—Infant mortality rates are presented here for both detailed race of mother and Hispanic origin of mother. The linked file is particularly useful for computing accurate infant mortality rates for this purpose because the race of the mother from the birth certificate is used in both the numerator and denominator of the infant mortality rate. In contrast, for the vital statistics mortality file, race information for the denominator is the race of the mother as reported on the birth certificate, whereas the race information for the numerator is the race of the decedent as reported on the death certificate (1,6). Another source of misclassification is misreported race on the death certificate where the race and ethnicity of the deceased infant is reported by the funeral director based on information provided by an informant or on observation. These different reporting methods can lead to differences in race- and ethnic-specific infant mortality rates between the two data files (6,7).

Rates for API and for Chinese, Japanese, Filipino, and other API mothers are reported for all 50 States and the District of Columbia. In addition, infant mortality data for five other detailed API groups, including Vietnamese, Asian Indian, Korean, Samoan, and Guamanian mothers, are presented for an 11-State reporting area: California, Hawaii, Illinois, Minnesota, Missouri, New Jersey, New York, Texas, Virginia, Washington, and West Virginia.

Race and Hispanic origin of mother are reported as separate items on the birth certificate; thus, a mother of Hispanic origin may be of any race. Although the overwhelming majority of Hispanic-origin births are to white women (3), there are notable differences in infant mortality trends between Hispanic and non-Hispanic white women. Race and ethnic differentials in infant mortality rates reflect differences in income, educational levels, access to health care, health insurance, and other factors.

Statistical significance—Text statements have been tested for statistical significance, and a statement that a given infant mortality rate is higher or lower than another rate indicates that the rates are significantly different. Information on the methods used to test for statistical significance, as well as information on differences between period and cohort data, the weighting of the linked file, and a comparison of infant mortality data between the linked file and the vital statistics mortality file are presented in the "Technical Notes." Additional information on maternal age, marital status, period of gestation, birthweight, and cause-of-death classification is also presented in the "Technical Notes."

Results and Discussion

Trends in infant mortality

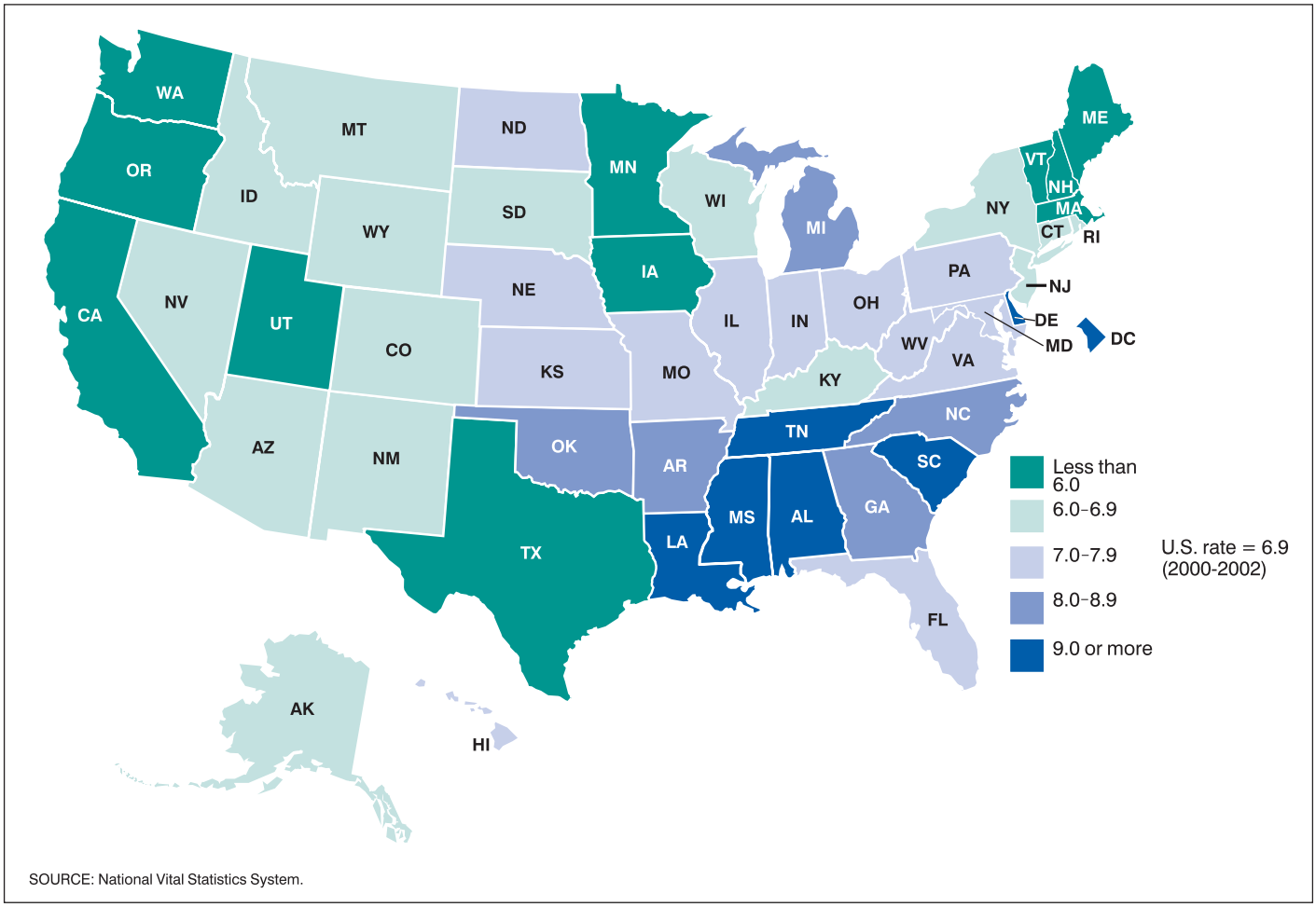
The overall 2002 infant mortality rate from the linked file was 7.0 infant deaths per 1,000 live births, higher than the rate in 2001 (6.8) and a return to the rate in 1999 (table D, figure 1) (the overall rate in 2002 was also 7.0 from the mortality file). This was the first significant rise in the infant mortality rate since 1958 (8). Infant mortality rates for race and Hispanic origin groups were generally higher in 2002 compared with 2001 but only the increase for infants of black mothers, from 13.3 to 13.8, was statistically significant (table D).

A preliminary analysis of the 2001–02 increase in the infant mortality rate was published earlier this year (8). This analysis discussed some of the potential explanatory factors that could account for the increase (8). Currently a more intensive analysis of these factors is under way utilizing information on maternal and infant health risk factors available in the linked birth/infant death data file for 2002. The results of this analysis will be addressed in a separate publication (9).

The infant mortality rate was 8 percent lower in 2002 than in 1995 (7.6) (table D). During this period, decreases have been observed for nearly all race and ethnic groups, although only a few had significant declines. Significant declines were observed for infants of non-Hispanic white (8 percent), non-Hispanic black (5 percent), and Mexican mothers (10 percent).

Infant mortality by race and Hispanic origin of mother

There continues to be a wide variation in infant mortality rates by race of mother with the highest rate, 13.9 per 1,000 live births, for



SOURCE: National Vital Statistics System.

Figure 2. Infant mortality rates by State, 2000–2002

infants of non-Hispanic black mothers, over four times greater than the lowest rate of 3.0 for infants of Chinese mothers. Rates were also high for infants of Hawaiian (9.6), American Indian (8.6), and Puerto Rican (8.2) mothers. Rates were intermediate for infants of non-Hispanic white (5.8) and Filipino mothers (5.7) (tables A and B).

In the 11-State reporting area for the expanded API subgroups, infant mortality rates were 3.7 for Asian Indian, Vietnamese, and Korean mothers (table C).

There was wide variation in infant mortality rates for Hispanic subgroups with the rates high for infants of Puerto Rican mothers (8.2) and low for Cuban mothers (3.7). Rates were intermediate for infants of Mexican and Central and South American mothers (5.4 and 5.1, respectively) (table B). Among Hispanics, only the rate for Mexican mothers showed a significant decline from 1995 to 2002 (6.0 in 1995).

Infant mortality by State

Between 2001 and 2002 more States had increases than decreases in the infant mortality rate. Three States, Kentucky, Missouri, and Texas, had significant increases and one State, New Jersey, had a significant decline (data not shown). Infant mortality rates varied considerably by State and within States by race and Hispanic origin of mother for 2000–2002 (table 3). To obtain statistically reliable rates by race and Hispanic origin, three years of data were combined. Generally, States in the South had the highest rates; rates were lowest for States in the West and Northeast (table 3 and figure 2). Infant mortality rates ranged from 10.5 for Mississippi to 4.8 for Massachusetts. The highest rate noted (11.4) was for the District of Columbia; however, the rate for the District of Columbia is more appropriately compared with rates for other large U.S. cities because of the high concentrations of high-risk women in these areas.

For infants of non-Hispanic black mothers, mortality rates ranged from 17.9 in Wisconsin to 9.5 in Washington State. Numerous community-based programs to reduce infant mortality are ongoing (10). For infants of non-Hispanic white mothers, Delaware had the highest infant mortality rate (7.9) and Massachusetts and New Jersey had the lowest rate (4.0).

For infants of American Indian and API mothers, mortality rates could be reliably computed for only 15 and 26 States, respectively. For infants of American Indian mothers, mortality rates ranged from 15.8 in Nebraska to 5.8 in Florida. Overall, infant mortality rates for infants of API mothers were the lowest, ranging from 3.3 in New Jersey to 8.4 in Utah.

Sex of Infant

In 2002 the overall infant mortality rate for female infants was 6.3 per 1,000, 17 percent lower than the rate for male infants (7.6). Infant mortality rates were higher for male than female infants in each race group (table 1). Among Hispanics this difference was only significant for infants of Mexican mothers (table 2).

Multiple births

For plural births, the infant mortality rate was 32.3, more than five times the rate of 6.1 for single births (table 1). Infant mortality rates that could be reliably calculated for plural births were higher than rates for single births for all race and Hispanic-origin groups.

For triplet births, the infant mortality rate declined significantly from 2001 (71.4) to 2002 (60.1). No other plurality group had a significant change from the year before.

The risk of infant death increases with the increasing number of infants in the pregnancy (11). In 2002 the infant mortality rates for quadruplets (160.4) and triplets (60.1) were more than five times and about twice, respectively, the rate for twin births (30.2). Rates for quadruplets and triplets were more than 26 and nearly 10 times, respectively, the rate for single births (6.1) (tabular data not shown).

Age at death

In 2002 two-thirds of all infant deaths (18,791 out of 27,970) occurred in the first 27 days of life, the neonatal period. The neonatal mortality rate, 4.7 deaths per 1,000 live births in 2002 was more than double the postneonatal mortality rate (28 days to under 1 year), 2.3. The neonatal mortality rate increased 4 percent from 2001 (4.5). The postneonatal mortality rate remained unchanged from the previous year.

The neonatal mortality rate for infants of non-Hispanic black mothers (9.3) was significantly higher than for all other groups. Infants of non-Hispanic black, American Indian, and Hawaiian mothers had the highest postneonatal mortality rates of any group (4.6, 4.0, and 4.0, respectively). For the total population and for infants of non-Hispanic white and non-Hispanic black mothers, the neonatal mortality rates were more than twice the postneonatal rates. For infants of Chinese mothers the neonatal rate was over three times the postneonatal rate (2.4 and 0.7, respectively). For infants of Mexican, Puerto Rican, and Central and South American mothers the neonatal mortality rate was at least double the postneonatal rate (tables A and B).

Postneonatal mortality rates appeared to be relatively stable for most race and ethnic groups, with the exception of infants of American Indian mothers. For this group, the postneonatal mortality rate declined by 26 percent from 2001 to 2002, from 5.4 to 4.0. Postneonatal mortality rates have been higher for infants of American Indian mothers than for other race and ethnic groups for many years, primarily due to their higher rates of SIDS and injuries. This decrease in postneonatal mortality accounts for the overall decline in mortality for infants of American Indian mothers suggested by the 2002 data. A recent initiative addresses American Indian postneonatal mortality (12).

Birthweight and period of gestation

Birthweight and period of gestation are the two most important predictors of an infant's subsequent health and survival. Infants born too small or too soon have a much greater risk of death and both short-term and long-term disability than those born at term (37–41 weeks of gestation) or with birthweights of 2,500 grams or more (13–15). The percent of infants born at low birthweight (less than 2,500 grams) ranged from 5.5 percent for births to Chinese mothers to 13.4 percent for births to non-Hispanic black mothers (tables 4 and 5). The percent of preterm births (those born before 37 completed weeks of gestation) ranged from 7.7 percent for births to Chinese mothers to 17.7 percent for births to non-Hispanic black mothers.

For all race and ethnic groups studied, infant mortality rates were much higher for low-birthweight infants (59.5) than for infants with birthweights of 2,500 grams or more (2.4). Overall, the infant mortality rate for very-low-birthweight infants (those with birthweights of less than 1,500 grams) was 250.8, more than 104 times the rate for infants with birthweights of 2,500 grams or more (table 6).

Similarly, the infant mortality rate for very preterm infants (those born at less than 32 weeks of gestation) was 186.4, nearly 75 times the rate for infants born at term (2.5) (37–41 weeks of gestation) (tables 1 and 2).

At least 86 percent of infants with birthweights of less than 500 grams died within the first year of life (table 6). Reporting of deaths among these very small infants may be incomplete (data not shown). An infant's chances of survival increase rapidly with increasing birthweight. Infant mortality rates were lowest at birthweights of 3,000 to 4,999 grams.

Trends in birthweight-specific infant mortality rates for the period 1995 to 2002 are shown in table 6. Generally declines were larger for infants weighing at least 2,500 grams. The birthweight-specific decline in infant mortality was greatest (22 percent) among infants weighing 4,000 to 4,499 grams (from 1.8 to 1.4) (table 6). For infants of white mothers the largest decline was also for infants weighing 4,000 to 4,499 grams (25 percent). The largest decline by specified birthweight for infants of non-Hispanic black mothers was for those weighing 3,500 to 3,999 grams (20 percent).

There were no significant changes in birthweight-specific infant mortality for infants of American Indian mothers (table 6). Infants of API mothers weighing 1,500 to 1,999 grams had the largest decline, 44 percent (41.2 to 23.2). Among infants of Hispanic mothers the largest decline was for those weighing 3,500 to 3,999 grams (1.8 to 1.4).

Although the 1995–2002 trends in birthweight-specific infant mortality rates were down, for 2001–02, there was an increase in these rates for infants weighing less than 2,500 grams (the increase for less than 1,500 grams was significant). Changes in the distributions of births by birthweight and in birthweight-specific infant mortality rates for the more recent period, 2001–02, are addressed in the separate analysis of the 2002 increase in the infant mortality rate (9).

In recent years the number of live-born infants and fetal deaths of very low birthweights, i.e., less than 500 grams, has increased. As noted above, however, the reporting of deaths among these very small, nonviable live-born infants is incomplete. These issues are considered in detail in the forthcoming special analysis (9).

Prenatal care

Prenatal care includes patient education, early recognition of risk factors and symptoms, and monitoring. Consequently, increasing early access to prenatal care has often been the focus of efforts to reduce infant mortality, especially among women with medical and demographic risk factors for adverse outcomes. The initiation and subsequent utilization of prenatal care is viewed as an indicator for access to care (16–20).

In 2002 the mortality rate for infants of mothers who began prenatal care after the first trimester of pregnancy, or not at all, was 9.0 per 1,000. This rate was 45 percent higher than the rate for infants of mothers whose care began in the first trimester (6.2).

For each race and Hispanic origin group, infant mortality rates were higher for mothers who began prenatal care after the first trimester, or received no care, than for mothers who received early care (tables 1 and 2). These differences were significant for all but infants of American Indian and Central or South American mothers. Because of the small number of infant deaths for Cuban mothers with late or no care, a reliable rate could not be calculated.

Overall, the infant mortality rates for women who began care in the third trimester (6.0) were lower than for women who began care in the second trimester (7.3). This is because women who began prenatal care in the third trimester had to have a gestation period of at least 7 months, thus reducing the probability that the infant would be born preterm or of low birthweight (21). The relationship between month of initiation of prenatal care and length of gestation is complex. Therefore, to be able to compare women who receive the timeliest care with all other women, the category "after first trimester or no care" is reported (tables 1 and 2).

It has been suggested that especially when certain pregnancy complications are present (e.g., post-term pregnancy, pregnancy-induced hypertension), infants of both black and white women who do not obtain prenatal care are at increased risk of postneonatal death (22).

Maternal age

Infant mortality rates vary with maternal age; infants of teenage mothers and mothers aged 40 years and over have the highest rates (10.4 and 8.5, respectively). The lowest rates are for infants of mothers in their late twenties and early thirties (tables 1 and 2).

In 2002 among births to teenagers, infants of the youngest mothers (under age 15 years) had the highest rate (17.6). The rate for infants of mothers aged 15–17 years increased between 2001 and 2002, from 10.7 per 1,000 to 11.5; the rate for infants of mothers aged 18–19 years was 9.5 in 2001 compared with 9.7 in 2002 (tabular data not shown).

Within race and ethnic subgroups, among groups for which rates could be reliably computed, infant mortality rates for births to non-Hispanic white teenage mothers were higher than for mothers aged 40 years and over. In contrast, for Mexican mothers, rates for births to the oldest mothers were higher than rates for infants of teenagers.

Studies suggest that the higher mortality risk for infants of younger mothers may be related to socioeconomic factors as well as biologic immaturity (23); young maternal age might be a marker for poverty (24–26). Among older mothers, especially those of low socioeconomic status, infant mortality rates may be affected by pregnancy complications related to higher maternal age (e.g., gestational diabetes mellitus and hypertensive disorders) (27).

Maternal education

Infant mortality rates generally decreased with increasing educational level (tables 1 and 2). This pattern may reflect the effects of more education as well as socioeconomic differences; women with more education tend to have higher income levels (28). However, infants of mothers with 0–8 years of education had a lower infant mortality rate compared with those with 9–11 years of education. This may be because most mothers with 0–8 years of education were born outside of the 50 States and the District of Columbia (29) and their infant mortality rates tend to be lower than for native-born mothers (see "Nativity").

Live-birth order

Infant mortality rates were generally higher for first births than for second births, and then generally increased as birth order increased (tables 1 and 2). Overall, the infant mortality rate for first births (7.0) was 15 percent higher than for second births (6.1). The rate for fifth and higher order births (11.1) was 82 percent higher than the rate for second births. The higher parities and therefore the highest order births (5th child and above) are more likely to be associated with older maternal age and lower socioeconomic status (30).

Higher live-birth order (4th child and above), which is likely to be associated with household crowding, has been associated with an increased risk of bronchiolitis-related infant mortality (31).

Marital status

Marital status may be a marker for the presence or absence of social, emotional, and financial resources (32,33). The support afforded by such resources may have a positive effect on fetal growth through fostering healthy maternal behaviors (34). Infants of mothers who are not married have been shown to be at higher risk for poor outcomes (35–37). In 2002 infants of married mothers had a mortality rate of 5.4 per 1,000. The mortality rate for infants of unmarried mothers was 9.9, more than 83 percent higher than the rate for infants of married mothers (tables 1 and 2). Within each race and Hispanic origin group, infants of unmarried mothers had higher rates of mortality and, with the exception of Cuban infants, these differences were significant.

Nativity

In 2002 the infant mortality rate for mothers born in the 50 States and the District of Columbia (7.3) was 43 percent higher than the rate for mothers born outside of the 50 States and the District of Columbia (5.1). Among race and Hispanic-origin groups for whom infant mortality rates could be calculated, all had higher infant mortality rates for mothers born in the 50 States and the District of Columbia (the difference was not significant for Puerto Rican, Cuban, and Central and South American mothers) (tables 1 and 2).

A variety of different hypotheses have been advanced to account for the lower infant mortality rate among infants of mothers born outside the 50 States and the District of Columbia, including possible differences in the level of familial integration and social support for new mothers (38–40). Also, women born outside the 50 States and the District of Columbia have been shown to have different characteristics than their U.S.-born counterparts with regard to socioeconomic and educational status, and risk behaviors such as smoking and alcohol use (40,41).

Maternal smoking

Tobacco use during pregnancy causes the passage of substances such as nicotine, hydrogen cyanide, and carbon monoxide from the placenta into the fetal blood supply. These substances restrict the growing infant's access to oxygen and can lead to adverse pregnancy and birth outcomes such as low birthweight, preterm delivery, intrauterine growth retardation, and infant mortality (42–45).

The infant mortality rate for infants of smokers was 11.1 in 2002, 68 percent higher than the rate of 6.6 for nonsmokers and also 6 percent higher than the rate in 2001 (10.5). For each race and Hispanic-origin group for which these rates could be computed, the infant mortality rate for smokers was higher than for nonsmokers (tables 1 and 2). Infant mortality rates for API mothers who smoked during pregnancy were two and one-half times the rates for nonsmokers.

Leading causes of infant death

Infant mortality rates for the five leading causes of infant death are presented in table 7 by race and Hispanic origin of mother. The leading cause of infant death in the United States in 2002 was Congenital malformations, deformations and chromosomal abnormalities (congenital malformations), accounting for 20 percent of all infant deaths. Disorders relating to short gestation and low birthweight, not elsewhere classified (low birthweight) was second, accounting for 17 percent of all infant deaths, followed by Sudden infant death syndrome (SIDS), accounting for 8 percent of infant deaths. The fourth and fifth leading causes—Newborn affected by maternal complications of pregnancy (maternal complications), and Newborn affected by complications of placenta, cord, and membranes (cord complications), accounted for 6 and 4 percent, respectively, of all infant deaths in 2002. Together the five leading causes accounted for 55 percent of all infant deaths in the United States in 2002.

The order of the first four leading causes of death was the same in 2002 as in the previous year. However, Cord complications was the fifth leading cause in 2002, replacing Respiratory distress of newborn, which was fifth in 2001, but a close sixth in 2002.

The rank order of leading causes of infant death varied substantially by race and Hispanic origin of the mother. Congenital malformations was the leading cause of infant death for all groups except for non-Hispanic black and Puerto Rican mothers, for whom low birthweight was the leading cause.

Reflecting the overall increase in infant mortality between 2001 and 2002, cause-specific infant mortality rates increased significantly for low birthweight (up 5 percent) and maternal complications (up 14 percent), although part of the increase for maternal complications is due to a change in coding rules for this cause; see "Technical Notes." Rates for Congenital malformations and SIDS were also higher in 2002 than in 2001, although the differences were not statistically significant. The rate for cord complications was unchanged from 2001–02.

When examined by race and ethnicity, only a few groups had significant changes by cause from 2001–02. For all Hispanic mothers, infant mortality from low birthweight and maternal complications both increased from 2001–02, while for Mexican mothers infant mortality from low birthweight increased.

When differences between cause-specific infant mortality rates were examined by race and ethnicity, infant mortality rates from Congenital malformations were 31 percent higher for non-Hispanic black and 44 percent higher for American Indian than for non-Hispanic white mothers. Rates were also 12 percent higher for Mexican than for non-Hispanic white mothers. Infant mortality rates from Congenital malformations were 18 percent lower for API than for non-Hispanic white mothers.

Infants of non-Hispanic black mothers had the highest mortality rates from low birthweight; the rate for non-Hispanic black mothers was 4.1 times the rate for non-Hispanic white mothers. The rate for Puerto Rican mothers was 2.2 times the rate for non-Hispanic white mothers.

SIDS rates were highest for American Indian and non-Hispanic black mothers—2.2 and 2.0 times those for non-Hispanic white mothers, respectively. As most SIDS deaths occur during the postneonatal period, the high SIDS rates for infants of non-Hispanic black and American Indian mothers accounted for much of their elevated risk of postneonatal mortality. SIDS rates for API mothers were less than one-half those for non-Hispanic white mothers. The SIDS rate for Mexican mothers was 48 percent lower, and for Central and South American mothers, 62 percent lower than the rate for non-Hispanic white mothers.

For maternal complications and cord complications, infants of non-Hispanic black mothers had the highest mortality rates—2.7 and 2.5 times, respectively, than those for non-Hispanic white mothers. For maternal complications, infant mortality rates for Puerto Rican mothers were 41 percent higher than for non-Hispanic white mothers, although this difference was not statistically significant. The higher percent of non-Hispanic black and Puerto Rican infants born at low birthweight may help to explain their higher infant mortality rates from these causes, which occur predominantly among low-birthweight infants. Infant mortality rates from maternal complications were 31 and 39 percent lower, respectively, for Mexican and Central and South American women than for non-Hispanic white women.

An examination of cause-specific differences in infant mortality rates between race and Hispanic-origin groups can help the researcher to understand overall differences in infant mortality rates between these groups. For example, 30 percent of the elevated infant mortality rate for non-Hispanic black mothers, when compared with non-Hispanic white mothers, can be accounted for by their higher rate from low birthweight, 7 percent by differences in SIDS, and 7 percent by differences in maternal complications. In other words, if non-Hispanic black infant mortality rates for these three causes could be reduced to the levels for non-Hispanic white infants, the difference in the infant mortality rate between non-Hispanic black and non-Hispanic white mothers would be reduced by 44 percent.

For American Indian mothers, 24 percent of their elevated infant mortality rate, when compared with non-Hispanic white mothers, can be accounted for by their higher SIDS rates, 20 percent by differences in Congenital malformations, and 11 percent by differences in low birthweight. Thus, if American Indian infant mortality rates for these three causes could be reduced to non-Hispanic white levels, the difference in the infant mortality rate between American Indian and non-Hispanic white mothers would be reduced by 55 percent.

Similarly, 38 percent of the difference between Puerto Rican and non-Hispanic white infant mortality rates can be accounted for by differences in low birthweight, 15 percent by differences in Congenital malformations, and 6 percent by differences in maternal complications. If Puerto Rican infant mortality for these three causes could be reduced to non-Hispanic white levels, the difference in the infant mortality rate between Puerto Rican and non-Hispanic white infants would be reduced by 59 percent. In addition to helping to explain differences in infant mortality rates between various groups, comparisons such as these can be helpful in targeting prevention efforts.

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List of Detailed Tables

Table 1. Infant mortality rates, live births, and infant deaths, by selected characteristics and specified race of mother: United States, 2002 linked file

Characteristics	All races	Race of mother			
		White	Black	American Indian[1]	Asian or Pacific Islander
	Infant mortality rates per 1,000 live births in specified group				
Total	7.0	5.8	13.8	8.6	4.8
Age at death:					
Total neonatal	4.7	3.9	9.3	4.6	3.4
Early neonatal (less than 7 days)	3.7	3.1	7.6	3.2	2.7
Late neonatal (7–27 days)	0.9	0.8	1.7	1.4	0.7
Postneonatal	2.3	1.9	4.5	4.0	1.4
Sex:					
Male	7.6	6.4	14.8	9.7	5.1
Female	6.3	5.1	12.8	7.6	4.4
Plurality:					
Single births	6.1	5.0	12.3	7.9	4.3
Plural births	32.3	28.0	55.9	38.4	23.5
Birthweight:					
Less than 2,500 grams	59.5	54.7	76.5	64.2	41.0
Less than 1,500 grams	250.8	242.1	272.1	249.1	218.4
1,500–2,499 grams	15.1	15.3	15.4	24.0	10.7
2,500 grams or more	2.4	2.2	3.9	4.3	1.6
Period of gestation:					
Less than 32 weeks	186.4	175.8	212.9	158.6	163.4
32–36 weeks	9.2	8.7	11.1	13.1	7.3
37–41 weeks	2.5	2.2	4.0	4.3	1.7
42 weeks or more	3.1	2.8	4.7	5.9	2.5
Trimester of pregnancy prenatal care began:					
First trimester	6.2	5.2	12.8	7.9	4.4
After first trimester or no care	9.0	7.6	14.3	9.5	5.3
Second trimester	7.3	6.5	10.5	8.9	4.3
Third trimester	6.0	4.9	9.3	*	4.5
No prenatal care	38.4	29.9	58.0	*	30.5
Age of mother:					
Under 20 years	10.4	8.8	15.2	9.1	9.2
20–24 years	7.8	6.4	13.9	9.4	5.2
25–29 years	6.0	5.1	12.4	7.6	3.9
30–34 years	5.6	4.7	13.4	7.6	4.3
35–39 years	6.5	5.5	14.5	8.5	5.4
40–54 years	8.5	7.3	16.1	*	8.2
Educational attainment of mother:					
0–8 years	6.6	6.1	14.7	*	4.0
9–11 years	9.6	8.0	15.8	8.3	5.9
12 years	7.8	6.5	13.4	9.1	5.6
13–15 years	6.0	4.9	11.7	8.6	4.7
16 years and over	4.2	3.7	9.9	*	3.7
Live-birth order:					
1	7.0	5.9	14.2	9.1	4.7
2	6.1	5.2	12.3	8.4	4.0
3	6.6	5.6	12.2	6.8	5.2
4	8.3	6.7	15.1	7.9	7.8
5 or more	11.1	8.7	18.7	11.2	7.7
Marital status:					
Married	5.4	5.0	11.8	7.2	4.4
Unmarried	9.9	7.9	14.8	9.6	7.1
Mother's place of birth:					
Born in the 50 States and DC	7.3	5.9	14.2	8.7	6.6
Born elsewhere	5.1	4.9	8.8	*	4.3
Maternal smoking during pregnancy:[2]					
Smoker	11.1	9.8	20.0	12.1	11.6
Nonsmoker	6.6	5.3	13.1	7.7	4.7

See footnotes at end of table.

Table 1. Infant mortality rates, live births, and infant deaths, by selected characteristics and specified race of mother: United States, 2002 linked file—Con.

Characteristics	All races	Race of mother			
		White	Black	American Indian[1]	Asian or Pacific Islander
	Live births				
Total	4,021,825	3,174,807	593,743	42,367	210,908
Sex:					
Male	2,058,037	1,626,328	301,530	21,423	108,756
Female	1,963,788	1,548,479	292,213	20,944	102,152
Plurality:					
Single births	3,889,276	3,069,960	572,699	41,362	205,255
Plural births	132,549	104,847	21,044	1,005	5,653
Birthweight:					
Less than 2,500 grams	315,028	216,373	79,137	3,072	16,446
Less than 1,500 grams	59,361	37,569	18,841	549	2,402
1,500–2,499 grams	255,667	178,804	60,296	2,523	14,044
2,500 grams or more	3,705,556	2,957,532	514,367	39,286	194,371
Not stated	1,241	902	239	9	91
Period of gestation:					
Less than 32 weeks	77,877	50,326	23,660	868	3,023
32–36 weeks	402,972	299,956	79,801	4,625	18,590
37–41 weeks	3,231,562	2,577,101	448,002	32,923	173,536
42 weeks or more	268,096	214,606	37,956	3,557	11,977
Not stated	41,318	32,818	4,324	394	3,782
Trimester of pregnancy prenatal care began:					
First trimester	3,301,213	2,664,128	434,099	28,833	174,153
After first trimester or no care	641,456	454,505	143,167	12,460	31,324
Second trimester	499,014	357,575	107,393	9,158	24,888
Third trimester	103,325	71,673	23,757	2,548	5,347
No prenatal care	39,117	25,257	12,017	754	1,089
Not stated	79,156	56,174	16,477	1,074	5,431
Age of mother:					
Under 20 years	432,825	309,879	106,993	7,840	8,113
20–24 years	1,022,132	783,010	194,719	14,343	30,060
25–29 years	1,060,420	851,159	136,604	10,138	62,519
30–34 years	951,229	779,538	95,013	6,338	70,340
35–39 years	453,939	369,840	48,393	2,976	32,730
40–54 years	101,280	81,381	12,021	732	7,146
Educational attainment of mother:					
0–8 years	239,622	216,932	13,913	1,705	7,072
9–11 years	614,968	461,280	128,424	11,153	14,111
12 years	1,234,741	937,997	231,845	16,446	48,453
13–15 years	851,738	664,946	135,547	8,828	42,417
16 years and over	1,026,820	854,863	73,837	3,639	94,481
Not stated	53,936	38,789	10,177	596	4,374
Live-birth order:					
1	1,594,949	1,258,506	222,845	14,837	98,761
2	1,306,795	1,049,590	173,145	11,784	72,276
3	675,278	536,537	105,569	7,568	25,604
4	264,268	202,695	49,309	4,087	8,177
5 or more	170,266	119,760	41,063	3,962	5,481
Not stated	10,269	7,719	1,812	129	609
Marital status:					
Married	2,655,815	2,270,333	188,848	17,070	179,564
Unmarried	1,366,010	904,474	404,895	25,297	31,344
Mother's place of birth:					
Born in the 50 States and DC	3,079,253	2,489,080	514,714	39,931	35,528
Born elsewhere	933,408	679,913	76,574	2,362	174,559
Not stated	9,164	5,814	2,455	74	821
Maternal smoking during pregnancy:[2]					
Smoker	397,199	337,313	48,579	7,672	3,635
Nonsmoker	3,077,208	2,394,749	509,900	31,273	141,286
Not stated	18,046	14,185	2,607	389	865

See footnotes at end of table.

Table 1. Infant mortality rates, live births, and infant deaths, by selected characteristics and specified race of mother: United States, 2002 linked file—Con.

Characteristics	All races	Race of mother			
		White	Black	American Indian[1]	Asian or Pacific Islander
	Infant deaths				
Total	27,970	18,395	8,201	366	1,006
Age at death:					
Total neonatal	18,791	12,352	5,533	195	710
Early neonatal (less than 7 days)	15,020	9,804	4,506	137	573
Late neonatal (7–27 days)	3,771	2,548	1,027	58	138
Postneonatal	9,179	6,044	2,668	171	296
Sex:					
Male	15,690	10,459	4,467	208	556
Female	12,279	7,936	3,734	158	450
Plurality:					
Single births	23,691	15,465	7,025	328	874
Plural births	4,278	2,931	1,176	39	133
Birthweight:					
Less than 2,500 grams	18,758	11,830	6,056	197	675
Less than 1,500 grams	14,885	9,097	5,127	137	525
1,500–2,499 grams	3,873	2,733	929	61	150
2,500 grams or more	8,840	6,366	1,993	168	313
Not stated	371	199	152	1	19
Period of gestation:					
Less than 32 weeks	14,515	8,845	5,038	138	494
32–36 weeks	3,692	2,612	884	61	135
37–41 weeks	8,001	5,761	1,801	141	298
42 weeks or more	824	594	179	21	29
Not stated	937	582	299	6	50
Trimester of pregnancy prenatal care began:					
First trimester	20,521	13,957	5,569	227	769
After first trimester or no care	5,758	3,433	2,042	118	165
Second trimester	3,637	2,324	1,124	81	108
Third trimester	618	354	222	18	24
No prenatal care	1,503	755	697	18	33
Not stated	1,690	1,005	591	21	73
Age of mother:					
Under 20 years	4,496	2,724	1,626	72	75
20–24 years	8,016	5,014	2,711	135	156
25–29 years	6,352	4,334	1,700	77	241
30–34 years	5,312	3,695	1,269	48	299
35–39 years	2,934	2,031	701	25	176
40–54 years	858	597	194	9	59
Educational attainment of mother:					
0–8 years	1,581	1,332	205	15	28
9–11 years	5,875	3,671	2,027	93	84
12 years	9,641	6,107	3,114	150	270
13–15 years	5,099	3,236	1,587	76	200
16 years and over	4,290	3,192	731	17	349
Not stated	1,484	857	536	16	75
Live-birth order:					
1	11,139	7,383	3,155	134	467
2	7,927	5,410	2,131	99	287
3	4,481	3,008	1,289	51	133
4	2,194	1,352	746	32	64
5 or more	1,898	1,043	769	44	42
Not stated	330	199	112	5	13
Marital status:					
Married	14,404	11,277	2,220	124	783
Unmarried	13,566	7,118	5,981	243	224

See footnotes at end of table.

Table 1. Infant mortality rates, live births, and infant deaths, by selected characteristics and specified race of mother: United States, 2002 linked file—Con.

Characteristics	All races	Race of mother			
		White	Black	American Indian[1]	Asian or Pacific Islander
	Infant deaths				
Mother's place of birth:					
Born in the 50 States and DC	22,581	14,706	7,293	346	236
Born elsewhere	4,777	3,338	676	16	747
Not stated	612	352	232	4	24
Maternal smoking during pregnancy:[2]					
Smoker	4,406	3,298	973	93	42
Nonsmoker	20,255	12,653	6,693	239	671
Not stated	436	268	146	10	11

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.

[1]Includes Aleuts and Eskimos.

[2]Excludes data for California, which does not report tobacco use on the birth certificate.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. Not stated responses were included in totals but not distributed among groups for rate computations.

Table 2. Infant mortality rates, live births, and infant deaths, by selected characteristics and Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: United States, 2002 linked file

Characteristics	All origins[1]	Hispanic						Non-Hispanic		
		Total	Mexican	Puerto Rican	Cuban	Central and South American	Other and unknown Hispanic	Total[2]	White	Black
	Infant mortality rates per 1,000 live births in specified group									
Total	7.0	5.6	5.4	8.2	3.7	5.1	7.1	7.3	5.8	13.9
Age at death:										
Total neonatal	4.7	3.8	3.6	5.8	3.2	3.5	5.1	4.8	3.9	9.3
Early neonatal (less than 7 days)	3.7	3.0	2.9	4.9	2.7	2.7	4.3	3.9	3.0	7.6
Late neonatal (7–27 days)	0.9	0.8	0.8	0.9	*	0.8	0.9	1.0	0.8	1.8
Postneonatal	2.3	1.8	1.8	2.4	*	1.6	2.0	2.4	1.9	4.6
Sex:										
Male	7.6	6.0	5.9	8.7	4.5	4.9	8.0	8.0	6.5	14.9
Female	6.3	5.2	4.9	7.7	2.9	5.3	6.2	6.5	5.1	12.8
Plurality:										
Single births	6.1	5.1	4.9	7.1	3.2	4.5	6.4	6.3	5.0	12.3
Plural births	32.3	31.1	30.0	42.9	*	27.6	37.7	32.3	27.1	55.9
Birthweight:										
Less than 2,500 grams	59.5	56.7	57.0	59.2	46.6	52.0	62.2	59.7	53.4	76.5
Less than 1,500 grams	250.8	241.8	247.7	234.4	188.6	213.7	268.1	250.9	239.5	272.1
1,500–2,499 grams	15.1	16.1	16.6	14.1	*	15.2	15.3	14.9	14.9	15.4
2,500 grams or more	2.4	2.0	2.0	2.6	*	1.7	2.3	2.5	2.2	3.9
Period of gestation:										
Less than 32 weeks	186.4	160.9	159.3	182.2	144.5	147.6	176.7	191.1	179.9	212.9
32–36 weeks	9.2	8.0	7.8	8.9	*	7.7	10.2	9.4	8.9	11.1
37–41 weeks	2.5	2.1	2.1	2.7	*	1.9	2.3	2.6	2.3	4.1
42 weeks or more	3.1	2.5	2.6	*	*	*	*	3.3	2.9	4.9
Trimester of pregnancy prenatal care began:										
First trimester	6.2	5.3	5.1	7.5	3.4	4.8	6.1	6.4	5.2	12.9
After first trimester or no care	9.0	6.0	5.7	9.7	*	5.5	7.7	10.2	8.6	14.4
Second trimester	7.3	5.2	5.0	7.9	*	4.6	6.5	8.2	7.4	10.5
Third trimester	6.0	3.4	3.3	*	*	*	*	7.1	6.1	9.5
No prenatal care	38.4	23.0	19.7	49.2	*	29.3	36.5	45.5	36.4	57.9
Age of mother:										
Under 20 years	10.4	7.3	6.8	10.6	*	6.8	10.9	11.6	9.7	15.2
20–24 years	7.8	5.3	5.0	8.2	*	4.8	6.5	8.7	6.9	14.0
25–29 years	6.0	5.1	4.8	7.4	*	4.9	6.8	6.2	5.1	12.5
30–34 years	5.6	5.0	5.1	7.2	*	4.4	4.4	5.6	4.6	13.4
35–39 years	6.5	6.2	6.3	7.6	*	5.1	7.3	6.4	5.3	14.6
40–54 years	8.5	8.9	9.2	*	*	8.2	*	8.3	6.8	16.3
Educational attainment of mother:										
0–8 years	6.6	5.3	5.1	11.5	*	5.8	7.6	10.4	9.9	15.2
9–11 years	9.6	6.1	5.7	9.7	*	6.0	7.4	11.7	9.9	15.9
12 years	7.8	5.6	5.3	8.8	*	4.7	7.4	8.4	6.9	13.6
13–15 years	6.0	4.9	5.0	6.0	*	4.3	5.3	6.1	4.8	11.9
16 years and over	4.2	4.0	4.1	3.9	*	4.4	*	4.2	3.7	10.0
Live-birth order:										
1	7.0	5.8	5.7	8.2	3.8	4.9	8.2	7.2	5.8	14.3
2	6.1	5.0	5.0	7.6	*	4.4	5.4	6.3	5.1	12.4
3	6.6	5.3	5.0	7.6	*	5.4	6.2	7.0	5.7	12.2
4	8.3	5.6	5.0	7.8	*	6.4	9.8	9.4	7.3	15.3
5 or more	11.1	7.9	7.4	13.8	*	7.7	*	12.3	9.1	18.8
Marital status:										
Married	5.4	5.0	5.0	6.9	3.0	4.4	5.8	5.5	4.9	11.8
Unmarried	9.9	6.4	6.0	9.1	5.4	5.9	8.9	11.2	8.8	14.8
Mother's place of birth:										
Born in the 50 States and DC	7.3	6.6	6.3	8.2	3.9	5.5	7.5	7.4	5.8	14.2
Born elsewhere	5.1	5.0	4.8	7.9	3.6	5.0	4.7	5.3	4.6	9.1
Maternal smoking during pregnancy:[3]										
Smoker	11.1	10.7	9.8	12.4	*	*	10.7	11.1	9.7	20.1
Nonsmoker	6.6	5.6	5.4	7.9	3.5	4.9	6.8	6.8	5.2	13.2

See footnotes at end of table.

Table 2. Infant mortality rates, live births, and infant deaths, by selected characteristics and Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: United States, 2002 linked file—Con.

Characteristics	All origins[1]	Hispanic						Non-Hispanic			Not stated
		Total	Mexican	Puerto Rican	Cuban	Central and South American	Other and unknown Hispanic	Total[2]	White	Black	
	Live births										
Total	4,021,825	876,654	627,510	57,469	14,232	125,984	51,459	3,119,987	2,298,168	578,366	25,184
Sex:											
Male	2,058,037	447,036	319,627	29,582	7,309	64,395	26,123	1,598,106	1,179,142	293,771	12,895
Female	1,963,788	429,618	307,883	27,887	6,923	61,589	25,336	1,521,881	1,119,026	284,595	12,289
Plurality:											
Single births	3,889,276	857,787	615,022	55,709	13,795	123,073	50,188	3,007,230	2,212,465	557,702	24,259
Plural births	132,549	18,867	12,488	1,760	437	2,911	1,271	112,757	85,703	20,664	925
Birthweight:											
Less than 2,500 grams	315,028	57,541	38,728	5,581	926	8,242	4,064	255,406	159,001	77,690	2,081
Less than 1,500 grams	59,361	10,359	6,771	1,143	165	1,526	754	48,494	27,225	18,485	508
1,500–2,499 grams	255,667	47,182	31,957	4,438	761	6,716	3,310	206,912	131,776	59,205	1,573
2,500 grams or more	3,705,556	818,987	588,705	51,874	13,304	117,728	47,376	2,863,735	2,138,605	500,481	22,834
Not stated	1,241	126	77	14	2	14	19	846	562	195	269
Period of gestation:											
Less than 32 weeks	77,877	14,737	9,880	1,471	222	2,133	1,031	62,573	35,662	23,244	567
32–36 weeks	402,972	84,780	59,761	6,538	1,262	11,744	5,475	315,868	215,479	78,199	2,324
37–41 weeks	3,231,562	692,314	493,514	45,212	11,808	101,253	40,527	2,520,020	1,885,188	435,923	19,228
42 weeks or more	268,096	64,998	47,247	4,016	882	8,997	3,856	201,650	149,898	36,896	1,448
Not stated	41,318	19,825	17,108	232	58	1,857	570	19,876	11,941	4,104	1,617
Trimester of pregnancy prenatal care began:											
First trimester	3,301,213	657,244	464,446	44,363	13,004	97,144	38,287	2,625,196	2,006,374	423,026	18,773
After first trimester or no care	641,456	199,151	148,970	11,155	1,134	26,287	11,605	438,624	257,102	139,867	3,681
Second trimester	499,014	152,459	113,453	8,872	944	20,236	8,954	343,841	206,536	104,923	2,714
Third trimester	103,325	34,096	25,378	1,730	149	4,910	1,929	68,609	37,993	23,085	620
No prenatal care	39,117	12,596	10,139	553	41	1,141	722	26,174	12,573	11,859	347
Not stated	79,156	20,259	14,094	1,951	94	2,553	1,567	56,167	34,692	15,473	2,730
Age of mother:											
Under 20 years	432,825	130,322	99,593	10,212	1,159	10,750	8,608	300,084	181,008	104,631	2,419
20–24 years	1,022,132	265,239	196,866	18,725	2,410	31,548	15,690	750,968	519,154	190,251	5,925
25–29 years	1,060,420	236,146	170,148	13,842	4,025	35,429	12,702	817,980	614,912	132,833	6,294
30–34 years	951,229	157,887	106,177	9,415	3,881	29,222	9,192	787,081	620,175	92,157	6,261
35–39 years	453,939	71,481	45,129	4,386	2,283	15,366	4,317	379,118	297,438	46,834	3,340
40–54 years	101,280	15,579	9,597	889	474	3,669	950	84,756	65,481	11,660	945
Educational attainment of mother:											
0–8 years	239,622	180,514	150,043	2,276	192	23,609	4,394	58,406	37,288	12,999	702
9–11 years	614,968	233,255	184,000	15,648	1,475	20,647	11,485	379,286	230,460	125,346	2,427
12 years	1,234,741	260,239	179,483	19,515	5,082	38,473	17,686	968,554	680,852	226,230	5,948
13–15 years	851,738	115,398	68,074	12,688	3,104	21,650	9,882	732,297	550,547	132,333	4,043
16 years and over	1,026,820	71,041	34,149	6,730	4,321	19,216	6,625	950,500	781,618	72,045	5,279
Not stated	53,936	16,207	11,761	612	58	2,389	1,387	30,944	17,403	9,413	6,785
Live-birth order:											
1	1,594,949	320,585	221,759	22,370	6,554	49,915	19,987	1,264,645	938,381	216,536	9,719
2	1,306,795	268,911	189,759	17,742	5,103	40,242	16,065	1,030,619	780,783	168,586	7,265
3	675,278	166,130	122,873	10,270	1,866	21,981	9,140	505,265	370,717	102,964	3,883
4	264,268	72,829	55,841	4,145	486	8,619	3,738	189,829	130,048	48,266	1,610
5 or more	170,266	46,249	35,919	2,839	209	4,978	2,304	122,734	73,547	40,367	1,283
Not stated	10,269	1,950	1,359	103	14	249	225	6,895	4,692	1,647	1,424
Marital status:											
Married	2,655,815	495,181	363,544	23,506	9,984	69,544	28,603	2,143,669	1,769,630	182,807	16,965
Unmarried	1,366,010	381,473	263,966	33,963	4,248	56,440	22,856	976,318	528,538	395,559	8,219
Mother's place of birth:											
Born in the 50 States and DC	3,079,253	321,261	226,150	37,713	6,396	14,455	36,547	2,737,913	2,161,864	507,205	20,079
Born elsewhere	933,408	553,846	400,550	19,586	7,832	111,420	14,458	375,391	132,638	68,953	4,171
Not stated	9,164	1,547	810	170	4	109	454	6,683	3,666	2,208	934
Maternal smoking during pregnancy:[3]											
Smoker	397,199	18,488	8,879	4,964	378	1,265	3,002	375,981	317,666	47,852	2,730
Nonsmoker	3,077,208	592,561	386,433	50,317	13,142	99,626	43,043	2,467,722	1,805,185	496,605	16,925
Not stated	18,046	2,536	1,807	158	13	248	310	14,243	10,667	2,455	1,267

See footnotes at end of table.

Table 2. Infant mortality rates, live births, and infant deaths, by selected characteristics and Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: United States, 2002 linked file—Con.

Characteristics	All origins[1]	Hispanic						Non-Hispanic			Not stated
		Total	Mexican	Puerto Rican	Cuban	Central and South American	Other and unknown Hispanic	Total[2]	White	Black	
	Infant deaths										
Total	27,970	4,927	3,399	471	53	637	368	22,647	13,327	8,031	395
Age at death:											
Total neonatal	18,791	3,360	2,283	334	46	435	263	15,109	8,853	5,399	322
Early neonatal (less than 7 days)	15,020	2,673	1,794	282	38	339	219	12,056	7,002	4,386	291
Late neonatal (7–27 days)	3,771	687	489	51	8	95	44	3,053	1,851	1,014	31
Postneonatal	9,179	1,567	1,116	137	7	202	105	7,538	4,474	2,632	74
Sex:											
Male	15,690	2,699	1,886	256	33	314	210	12,760	7,665	4,377	231
Female	12,279	2,228	1,512	215	20	323	158	9,887	5,661	3,654	164
Plurality:											
Single births	23,691	4,340	3,024	395	44	557	320	19,006	11,003	6,876	345
Plural births	4,278	587	374	76	9	80	48	3,641	2,323	1,155	51
Birthweight:											
Less than 2,500 grams	18,758	3,263	2,209	330	43	428	253	15,245	8,487	5,943	250
Less than 1,500 grams	14,885	2,504	1,677	268	31	326	202	12,169	6,519	5,029	212
1,500–2,499 grams	3,873	759	532	62	12	102	51	3,075	1,968	913	38
2,500 grams or more	8,840	1,621	1,163	135	9	205	109	7,141	4,723	1,962	79
Not stated	371	43	26	5	1	4	6	262	116	126	67
Period of gestation:											
Less than 32 weeks	14,515	2,371	1,574	268	32	315	182	11,958	6,415	4,949	187
32–36 weeks	3,692	680	466	58	9	91	56	2,976	1,928	867	36
37–41 weeks	8,001	1,450	1,035	122	10	190	93	6,495	4,307	1,771	56
42 weeks or more	824	161	123	12	–	17	8	655	428	179	8
Not stated	937	266	201	10	2	25	29	563	249	264	108
Trimester of pregnancy prenatal care began:											
First trimester	20,521	3,459	2,382	334	44	464	235	16,879	10,462	5,474	184
After first trimester or no care	5,758	1,203	851	108	9	145	89	4,495	2,221	2,011	61
Second trimester	3,637	796	567	70	6	94	58	2,815	1,532	1,105	26
Third trimester	618	117	84	10	–	18	5	488	232	219	12
No prenatal care	1,503	290	200	27	3	33	26	1,191	458	687	22
Not stated	1,690	266	165	29	–	27	44	1,273	644	547	151
Age of mother:											
Under 20 years	4,496	956	673	108	7	74	94	3,477	1,765	1,588	64
20–24 years	8,016	1,399	984	154	7	152	102	6,534	3,589	2,668	83
25–29 years	6,352	1,199	824	102	12	174	86	5,075	3,108	1,666	78
30–34 years	5,312	796	544	67	15	128	41	4,422	2,855	1,235	94
35–39 years	2,934	440	285	33	11	79	32	2,438	1,566	684	56
40–54 years	858	138	88	6	1	30	13	700	444	190	20
Educational attainment of mother:											
0–8 years	1,581	961	765	26	–	136	34	606	371	198	13
9–11 years	5,875	1,422	1,049	152	12	123	85	4,432	2,274	1,998	21
12 years	9,641	1,455	952	171	19	181	131	8,131	4,674	3,066	56
13–15 years	5,099	569	340	76	9	92	53	4,502	2,668	1,571	28
16 years and over	4,290	283	141	26	13	84	19	3,988	2,906	718	19
Not stated	1,484	237	151	19	–	20	46	988	433	480	258
Live-birth order:											
1	11,139	1,873	1,257	183	25	243	164	9,124	5,470	3,087	143
2	7,927	1,356	944	135	12	178	87	6,483	4,016	2,096	88
3	4,481	883	620	78	11	118	57	3,558	2,122	1,260	40
4	2,194	405	280	32	2	55	37	1,776	954	738	13
5 or more	1,898	366	267	39	3	38	18	1,511	670	761	21
Not stated	330	43	31	3	–	4	5	197	95	90	90
Marital status:											
Married	14,404	2,477	1,812	163	30	306	166	11,690	8,661	2,164	237
Unmarried	13,566	2,450	1,587	308	23	330	202	10,957	4,665	5,867	159

See footnotes at end of table.

Table 2. Infant mortality rates, live births, and infant deaths, by selected characteristics and Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: United States, 2002 linked file—Con.

Characteristics	All origins[1]	Hispanic						Non-Hispanic			Not stated
		Total	Mexican	Puerto Rican	Cuban	Central and South American	Other and unknown Hispanic	Total[2]	White	Black	
	Infant deaths										
Mother's place of birth:											
Born in the 50 States and DC	22,581	2,118	1,431	309	25	80	273	20,241	12,511	7,207	222
Born elsewhere	4,777	2,744	1,939	154	28	555	68	1,975	604	627	58
Not stated	612	65	29	7	–	2	27	431	212	197	115
Maternal smoking during pregnancy:[3]											
Smoker	4,406	198	87	62	3	14	32	4,165	3,078	961	43
Nonsmoker	20,255	3,322	2,100	396	46	486	294	16,756	9,316	6,579	177
Not stated	436	44	29	4	–	5	5	292	153	119	100

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.

– Quantity zero.

[1]Includes origin not stated.

[2]Includes races other than black or white.

[3]Excludes data for California, which does not report tobacco use on the birth certificate.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. Not stated responses were included in totals but not distributed among groups for rate computations.

Table 3. Infant mortality rates by race and Hispanic origin of mother: United States and each State, Puerto Rico, Virgin Islands, and Guam, 2000–2002 linked files

[By place of residence]

State	Total	Race and Hispanic origin of mother						
		Race				Hispanic origin		
		White	Black	American Indian[1]	Asian or Pacific Islander	Hispanic	Non-Hispanic white	Non-Hispanic black
		Infant mortality rates per 1,000 live births in specified group						
United States[2]	6.9	5.7	13.5	8.9	4.8	5.5	5.7	13.6
Alabama	9.3	6.8	14.8	*	*	7.0	6.8	14.7
Alaska	6.8	5.4	*	11.2	*	*	5.1	*
Arizona	6.7	6.3	14.4	9.4	5.3	6.0	6.5	14.4
Arkansas	8.3	7.2	12.8	*	*	4.5	7.5	12.8
California	5.4	5.0	11.4	7.6	4.5	5.1	4.7	11.4
Colorado	6.0	5.5	13.8	11.8	6.2	6.2	5.2	13.7
Connecticut	6.4	5.4	14.2	*	3.7	7.1	4.9	14.3
Delaware	9.6	7.9	14.8	*	*	7.9	7.9	14.9
District of Columbia	11.4	4.8	15.2	*	*	7.5	*	15.3
Florida	7.2	5.6	12.9	5.8	5.1	5.2	5.7	13.0
Georgia	8.7	6.3	13.4	*	6.8	6.0	6.3	13.4
Hawaii	7.2	6.6	*	*	7.3	6.0	6.3	*
Idaho	6.6	6.6	*	*	*	8.8	6.2	*
Illinois	7.8	6.1	15.8	*	6.5	6.4	5.9	15.8
Indiana	7.7	6.9	13.9	*	*	6.4	7.0	13.9
Iowa	5.8	5.6	11.7	*	*	6.7	5.5	11.4
Kansas	7.0	6.5	14.6	*	*	7.1	6.4	14.7
Kentucky	6.7	6.3	10.7	*	*	4.8	6.4	10.8
Louisiana	9.8	6.8	13.8	*	8.1	6.0	6.9	13.7
Maine	5.1	5.1	*	*	*	*	5.0	*
Maryland	7.7	5.3	12.6	*	4.5	5.7	5.3	12.7
Massachusetts	4.8	4.3	9.6	*	3.7	6.0	4.0	10.5
Michigan	8.1	6.3	16.9	*	4.9	6.7	6.0	16.9
Minnesota	5.5	4.9	10.8	10.3	6.1	6.5	4.7	10.8
Mississippi	10.5	7.0	14.8	*	*	*	7.0	14.7
Missouri	7.7	6.3	15.6	*	4.5	7.2	6.3	15.6
Montana	6.9	6.5	*	9.9	*	*	6.4	*
Nebraska	7.0	6.3	14.8	15.8	*	7.2	6.2	15.0
Nevada	6.0	5.3	13.6	*	4.7	5.1	5.1	13.7
New Hampshire	4.9	4.9	*	*	*	*	4.5	*
New Jersey	6.1	4.8	13.1	*	3.3	6.3	4.0	13.6
New Mexico	6.4	6.2	15.6	6.8	*	6.3	6.0	15.8
New York	6.1	5.0	10.7	*	3.4	5.5	4.8	11.2
North Carolina	8.4	6.3	15.0	10.6	5.9	5.6	6.4	15.1
North Dakota	7.8	7.2	*	13.4	*	*	6.8	*
Ohio	7.7	6.4	15.5	*	4.8	7.6	6.3	15.3
Oklahoma	8.0	7.3	14.6	7.6	*	5.7	7.4	14.5
Oregon	5.5	5.5	10.3	*	3.7	5.1	5.6	10.4
Pennsylvania	7.3	6.2	14.6	*	4.0	8.6	5.9	14.4
Rhode Island	6.7	6.2	11.9	*	*	8.0	5.3	12.6
South Carolina	9.0	5.9	15.0	*	*	4.6	6.0	14.9
South Dakota	6.4	5.5	*	11.6	*	*	5.4	*
Tennessee	9.0	7.0	17.0	*	*	6.2	7.0	17.0
Texas	5.9	5.3	11.1	*	4.0	5.1	5.5	11.1
Utah	5.3	5.2	*	*	8.4	6.5	5.0	*
Vermont	5.5	5.6	*	*	*	*	5.5	*
Virginia	7.2	5.4	13.7	*	4.6	4.8	5.5	13.6
Washington	5.5	5.3	9.5	10.6	4.8	5.1	5.2	9.5
West Virginia	7.9	7.8	12.1	*	*	*	7.7	11.7
Wisconsin	6.9	5.6	17.9	11.5	5.2	6.2	5.6	17.9
Wyoming	6.5	6.6	*	*	*	*	6.3	*
Puerto Rico	9.4	9.4	10.4	- - -	- - -	- - -	- - -	- - -
Virgin Islands	7.0	*	6.0	*	*	*	*	*
Guam	7.3	*	*	*	7.7	*	*	*

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.

- - - Data not available.

[1]Includes Aleuts and Eskimos.

[2]Excludes data for Puerto Rico, Virgin Islands, and Guam.

Table 4. Percent of live births with selected maternal and infant characteristics by specified race of mother: United States, 2002 linked file

Characteristic	All races	White	Black	American Indian[1]	Asian or Pacific Islander					
					Total	Chinese	Japanese	Hawaiian	Fillipino	Other
Birthweight:										
Less than 1,500 grams	1.5	1.2	3.2	1.3	1.1	0.7	1.0	1.6	1.3	1.2
Less than 2,500 grams	7.8	6.8	13.3	7.3	7.8	5.5	7.6	8.2	8.6	8.2
Preterm births[2]	12.1	11.1	17.6	13.1	10.4	7.7	9.2	13.5	12.7	10.5
Prenatal care beginning in the first trimester	83.7	85.4	75.2	69.8	84.8	87.2	90.5	78.1	85.4	83.9
Births to mothers under 20 years	10.8	9.8	18.0	18.5	3.8	0.9	1.7	14.6	4.5	4.0
Fourth and higher order births	10.8	10.2	15.3	19.1	6.5	2.1	3.9	16.3	7.3	7.1
Births to unmarried mothers	34.0	28.5	68.2	59.7	14.9	9.0	10.3	50.4	20.0	13.5
Mothers completing 12 or more years of school	78.5	78.4	75.6	69.2	89.7	88.7	97.8	85.7	94.7	88.4
Mothers born in the 50 States and DC	76.7	78.5	87.0	94.4	16.9	10.0	40.4	97.4	21.5	11.6
Mother smoked during pregnancy[3]	11.4	12.3	8.7	19.7	2.5	0.5	4.0	13.7	2.9	2.1

[1]Includes births to Aleuts and Eskimos.

[2]Born prior to 37 completed weeks of gestation.

[3]Excludes data for California, which does not report tobacco use on the birth certificate.

Table 5. Percent of live births with selected maternal and infant characteristics by Hispanic origin of mother and race of mother for mothers of non-Hispanic origin: United States, 2002 linked file

Characteristic	All origins[1]	Hispanic						Non-Hispanic		
		Total	Mexican	Puerto Rican	Cuban	Central and South American	Other and unknown Hispanic	Total[2]	White	Black
Birthweight:										
Less than 1,500 grams	1.5	1.2	1.1	2.0	1.2	1.2	1.5	1.6	1.2	3.2
Less than 2,500 grams	7.8	6.6	6.2	9.7	6.5	6.5	7.9	8.2	6.9	13.4
Preterm births[3]	12.1	11.6	11.4	14.0	10.5	11.2	12.8	12.2	11.0	17.7
Prenatal care beginning in the first trimester	83.7	76.7	75.7	79.9	92.0	78.7	76.7	85.7	88.6	75.2
Births to mothers under 20 years	10.8	14.9	15.9	17.8	8.1	8.5	16.7	9.6	7.9	18.1
Fourth and higher order births	10.8	13.6	14.7	12.2	4.9	10.8	11.8	10.0	8.9	15.4
Births to unmarried mothers	34.0	43.5	42.1	59.1	29.8	44.8	44.4	31.3	23.0	68.4
Mothers completing 12 or more years of school	78.5	51.9	45.8	68.5	88.2	64.2	68.3	85.8	88.3	75.7
Mothers born in the 50 States and DC	76.7	36.7	36.1	65.8	45.0	11.5	71.7	87.9	94.2	88.0
Mother smoked during pregnancy[4]	11.4	3.0	2.2	9.0	2.8	1.3	6.5	13.2	15.0	8.8

[1]Includes origin not stated.

[2]Includes races other than black or white.

[3]Born prior to 37 completed weeks of gestation.

[4]Excludes data for California, which does not report tobacco use on the birth certificate.

Table 6. Live births, infant, neonatal, and postneonatal deaths and mortality rates, by race and Hispanic origin of mother and birthweight: United States, 2002 linked file, and percent change in birthweight-specific infant mortality, 1995–2002 linked file

Race and birthweight	Number in 2002				Mortality rate per 1,000 live births in 2002			Percent change in infant mortality rate 1995–2002
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal	
All races[1]	4,021,825	27,970	18,791	9,179	7.0	4.7	2.3	–7.9
Less than 2,500 grams	315,028	18,758	15,324	3,434	59.5	48.6	10.9	–7.9
Less than 1,500 grams	59,361	14,885	13,078	1,807	250.8	220.3	30.4	–6.6
Less than 500 grams	6,780	5,844	5,688	156	861.9	838.9	23.0	–4.6**
500–749 grams	11,290	5,528	4,792	736	489.6	424.4	65.2	–7.3
750–999 grams	11,803	1,831	1,374	458	155.1	116.4	38.8	–14.8
1,000–1,249 grams	13,599	956	712	243	70.3	52.4	17.9	–17.8
1,250–1,499 grams	15,889	726	512	214	45.7	32.2	13.5	–16.3
1,500–1,999 grams	61,705	1,636	1,067	569	26.5	17.3	9.2	–20.2
2,000–2,499 grams	193,962	2,237	1,180	1,057	11.5	6.1	5.4	–14.8
2,500 grams or more	3,705,556	8,840	3,103	5,737	2.4	0.8	1.5	–20.0
2,500–2,999 grams	688,845	3,082	1,208	1,874	4.5	1.8	2.7	–16.7
3,000–3,499 grams	1,522,223	3,435	1,107	2,328	2.3	0.7	1.5	–20.7
3,500–3,999 grams	1,126,215	1,771	560	1,211	1.6	0.5	1.1	–20.0
4,000–4,499 grams	314,255	427	164	264	1.4	0.5	0.8	–22.2
4,500–4,999 grams	48,621	98	46	52	2.0	0.9	1.1	–9.1**
5,000 grams or more	5,397	27	18	9	5.0	*	*	–40.5**
Not stated	1,241	371	363	8	. . .	. . .	. . .	. . .
White	3,174,807	18,395	12,352	6,044	5.8	3.9	1.9	–7.9
Less than 2,500 grams	216,373	11,830	9,787	2,043	54.7	45.2	9.4	–8.4
Less than 1,500 grams	37,569	9,097	8,104	992	242.1	215.7	26.4	–7.1
Less than 500 grams	3,873	3,368	3,277	91	869.6	846.1	23.5	–4.6**
500–749 grams	6,690	3,382	3,003	379	505.5	448.9	56.7	–7.5
750–999 grams	7,370	1,201	936	265	163.0	127.0	36.0	–15.5
1,000–1,249 grams	8,937	652	516	136	73.0	57.7	15.2	–19.7
1,250–1,499 grams	10,699	492	371	121	46.0	34.7	11.3	–17.1
1,500–1,999 grams	43,113	1,142	792	350	26.5	18.4	8.1	–20.2
2,000–2,499 grams	135,691	1,591	890	701	11.7	6.6	5.2	–14.6
2,500 grams or more	2,957,532	6,366	2,370	3,996	2.2	0.8	1.4	–18.5
2,500–2,999 grams	495,210	2,133	900	1,233	4.3	1.8	2.5	–18.9
3,000–3,499 grams	1,191,645	2,463	848	1,615	2.1	0.7	1.4	–22.2
3,500–3,999 grams	948,175	1,354	444	910	1.4	0.5	1.0	–22.2
4,000–4,499 grams	275,107	321	129	191	1.2	0.5	0.7	–25.0
4,500–4,999 grams	42,764	74	34	39	1.7	0.8	0.9	–15.0**
5,000 grams or more	4,631	21	13	8	4.5	*	*	–41.6**
Not stated	902	199	195	4	. . .	. . .	. . .	. . .
Black	593,743	8,201	5,533	2,668	13.8	9.3	4.5	–5.5
Less than 2,500 grams	79,137	6,056	4,830	1,226	76.5	61.0	15.5	–3.4**
Less than 1,500 grams	18,841	5,127	4,397	731	272.1	233.4	38.8	–4.7
Less than 500 grams	2,617	2,231	2,173	58	852.5	830.3	22.2	–4.7**
500–749 grams	4,095	1,907	1,584	323	465.7	386.8	78.9	–6.7**
750–999 grams	3,827	541	371	170	141.4	96.9	44.4	–13.3
1,000–1,249 grams	3,970	258	160	98	65.0	40.3	24.7	–12.8**
1,250–1,499 grams	4,332	190	109	82	43.9	25.2	18.9	–9.7**
1,500–1,999 grams	15,156	409	216	193	27.0	14.3	12.7	–16.7
2,000–2,499 grams	45,140	520	218	302	11.5	4.8	6.7	–14.8
2,500 grams or more	514,367	1,993	554	1,439	3.9	1.1	2.8	–13.3
2,500–2,999 grams	140,541	798	239	558	5.7	1.7	4.0	–8.1**
3,000–3,499 grams	226,502	774	192	582	3.4	0.8	2.6	–17.1
3,500–3,999 grams	117,810	322	88	234	2.7	0.7	2.0	–22.9
4,000–4,499 grams	25,298	79	23	55	3.1	0.9	2.2	–27.9**
4,500–4,999 grams	3,741	16	7	9	*	*	*	*
5,000 grams or more	475	5	5	–	*	*	*	*
Not stated	239	152	149	3	. . .	. . .	. . .	. . .

See footnotes at end of table.

Table 6. Live births, infant, neonatal, and postneonatal deaths and mortality rates, by race and Hispanic origin of mother and birthweight: United States, 2002 linked file, and percent change in birthweight-specific infant mortality, 1995–2002 linked file—Con.

Race and birthweight	Number in 2002				Mortality rate per 1,000 live births in 2002			Percent change in infant mortality rate 1995–2002
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal	
American Indian[2]	42,367	366	195	171	8.6	4.6	4.0	–4.4**
Less than 2,500 grams	3,072	197	146	51	64.1	47.5	16.6	11.3**
Less than 1,500 grams	549	137	113	24	249.5	205.8	43.7	5.4**
Less than 500 grams	57	50	47	3	877.2	824.6	*	–1.3**
500–749 grams	103	42	37	5	407.8	359.2	*	–33.1**
750–999 grams	113	14	10	4	*	*	*	*
1,000–1,249 grams	124	14	9	5	*	*	*	*
1,250–1,499 grams	152	16	9	7	*	*	*	*
1,500–1,999 grams	591	19	15	4	*	*	*	*
2,000–2,499 grams	1,932	41	18	23	21.2	*	11.9	10.4**
2,500 grams or more	39,286	168	49	119	4.3	1.2	3.0	–18.9**
2,500–2,999 grams	6,746	45	17	28	6.7	*	4.2	–36.8**
3,000–3,499 grams	15,490	74	18	56	4.8	*	3.6	0.0**
3,500–3,999 grams	12,304	33	9	24	2.7	*	2.0	–34.1**
4,000–4,499 grams	3,870	10	3	7	*	*	*	*
4,500–4,999 grams	769	4	2	2	*	*	*	*
5,000 grams or more	107	1	–	1	*	*	*	*
Not stated	9	1	–	1	. . .	. . .	. . .	. . .
Asian or Pacific Islander	210,908	1,006	710	296	4.8	3.4	1.4	–9.4
Less than 2,500 grams	16,446	675	561	113	41.0	34.1	6.9	–11.4
Less than 1,500 grams	2,402	525	464	60	218.6	193.2	25.0	–8.8**
Less than 500 grams	233	195	192	3	836.9	824.0	*	–7.5**
500–749 grams	402	197	167	29	490.0	415.4	72.1	–5.1**
750–999 grams	493	75	57	18	152.1	115.6	*	–20.4**
1,000–1,249 grams	568	31	26	5	54.6	45.8	*	–39.9**
1,250–1,499 grams	706	27	22	5	38.2	31.2	*	–48.4**
1,500–1,999 grams	2,845	66	44	22	23.2	15.5	7.7	–43.7
2,000–2,499 grams	11,199	85	54	31	7.6	4.8	2.8	–26.9**
2,500 grams or more	194,371	313	130	183	1.6	0.7	0.9	–27.3
2,500–2,999 grams	46,348	106	52	54	2.3	1.1	1.2	–34.3
3,000–3,499 grams	88,586	123	49	74	1.4	0.6	0.8	–26.3
3,500–3,999 grams	47,926	61	19	42	1.3	*	0.9	–7.1**
4,000–4,499 grams	9,980	18	8	10	*	*	*	*
4,500–4,999 grams	1,347	4	2	2	*	*	*	*
5,000 grams or more	184	–	–	–	*	*	*	*
Not stated	91	19	19	–	. . .	. . .	. . .	. . .
Hispanic	876,654	4,927	3,360	1,567	5.6	3.8	1.8	–11.1
Less than 2,500 grams	57,541	3,263	2,695	569	56.7	46.8	9.9	–7.5
Less than 1,500 grams	10,359	2,504	2,203	301	241.7	212.7	29.1	–8.2
Less than 500 grams	1,070	875	848	27	817.8	792.5	25.2	–6.4**
500–749 grams	1,951	985	863	123	504.9	442.3	63.0	–6.7**
750–999 grams	2,085	328	247	81	157.3	118.5	38.8	–17.0
1,000–1,249 grams	2,390	172	140	32	72.0	58.6	13.4	–15.6**
1,250–1,499 grams	2,863	144	105	38	50.3	36.7	13.3	–7.5**
1,500–1,999 grams	10,952	321	230	90	29.3	21.0	8.2	–13.3**
2,000–2,499 grams	36,230	438	261	177	12.1	7.2	4.9	–6.9**
2,500 grams or more	818,987	1,621	624	997	2.0	0.8	1.2	–20.0
2,500–2,999 grams	149,252	552	255	297	3.7	1.7	2.0	–17.8
3,000–3,499 grams	349,880	615	204	411	1.8	0.6	1.2	–21.7
3,500–3,999 grams	245,269	354	116	238	1.4	0.5	1.0	–22.2
4,000–4,499 grams	63,677	69	30	39	1.1	0.5	0.6	–26.7**
4,500–4,999 grams	9,692	23	14	9	2.4	*	*	–20.0**
5,000 grams or more	1,217	8	5	3	*	*	*	*
Not stated	126	43	42	1	. . .	. . .	. . .	. . .

See footnotes at end of table.

Table 6. Live births, infant, neonatal, and postneonatal deaths and mortality rates, by race and Hispanic origin of mother and birthweight: United States, 2002 linked file, and percent change in birthweight-specific infant mortality, 1995–2002 linked file—Con.

Race and birthweight	Number in 2002				Mortality rate per 1,000 live births in 2002			Percent change in infant mortality rate 1995–2002
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal	
Non-Hispanic white	2,298,168	13,327	8,853	4,474	5.8	3.9	1.9	–7.9
Less than 2,500 grams	159,001	8,487	7,008	1,480	53.4	44.1	9.3	–9.2
Less than 1,500 grams	27,225	6,519	5,819	700	239.4	213.7	25.7	–7.2
Less than 500 grams	2,745	2,437	2,373	64	887.8	864.5	23.3	–3.7**
500–749 grams	4,733	2,383	2,120	262	503.5	447.9	55.4	–8.1
750–999 grams	5,316	875	691	184	164.6	130.0	34.6	–14.0
1,000–1,249 grams	6,554	478	374	104	72.9	57.1	15.9	–20.8
1,250–1,499 grams	7,877	346	260	86	43.9	33.0	10.9	–21.0
1,500–1,999 grams	32,175	817	559	258	25.4	17.4	8.0	–23.0
2,000–2,499 grams	99,601	1,151	630	521	11.6	6.3	5.2	–16.5
2,500 grams or more	2,138,605	4,723	1,730	2,993	2.2	0.8	1.4	–18.5
2,500–2,999 grams	346,644	1,575	637	939	4.5	1.8	2.7	–18.2
3,000–3,499 grams	842,563	1,840	641	1,199	2.2	0.8	1.4	–21.4
3,500–3,999 grams	702,068	992	324	669	1.4	0.5	1.0	–22.2
4,000–4,499 grams	210,936	252	100	152	1.2	0.5	0.7	–25.0
4,500–4,999 grams	33,000	50	20	30	1.5	0.6	0.9	–21.1**
5,000 grams or more	3,394	13	8	5	*	*	*	*
Not stated	562	116	115	1	. . .	. . .	. . .	. . .
Non-Hispanic black	578,366	8,031	5,399	2,632	13.9	9.3	4.6	–5.4
Less than 2,500 grams	77,690	5,943	4,733	1,209	76.5	60.9	15.6	–3.2**
Less than 1,500 grams	18,485	5,029	4,311	719	272.1	233.2	38.9	–4.6
Less than 500 grams	2,561	2,185	2,127	57	853.2	830.5	22.3	–4.7**
500–749 grams	4,030	1,878	1,558	320	466.0	386.6	79.4	–6.3**
750–999 grams	3,760	527	360	166	140.2	95.7	44.1	–14.3
1,000–1,249 grams	3,898	255	157	98	65.4	40.3	25.1	–12.0**
1,250–1,499 grams	4,236	184	107	78	43.4	25.3	18.4	–10.0**
1,500–1,999 grams	14,890	402	211	191	27.0	14.2	12.8	–16.4
2,000–2,499 grams	44,315	512	212	300	11.6	4.8	6.8	–13.4
2,500 grams or more	500,481	1,962	542	1,420	3.9	1.1	2.8	–15.2
2,500–2,999 grams	137,618	783	233	549	5.7	1.7	4.0	–8.1**
3,000–3,499 grams	220,512	761	187	574	3.5	0.8	2.6	–14.6
3,500–3,999 grams	113,987	321	88	233	2.8	0.8	2.0	–20.0
4,000–4,499 grams	24,313	77	22	54	3.2	0.9	2.2	–27.3**
4,500–4,999 grams	3,589	16	7	9	*	*	*	*
5,000 grams or more	462	5	5	–	*	*	*	*
Not stated	195	126	124	2	. . .	. . .	. . .	. . .

** Not significant at $p<.05$.

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.

. . . Category not applicable.

– Quantity zero.

[1]Includes races other than white or black.

[2]Includes Aleuts and Eskimos.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. Neonatal is less than 28 days, and postneonatal is 28 days to under 1 year.

Table 7. Infant deaths and mortality rates for the five leading causes of infant death, by race and Hispanic origin of mother: United States, 2002 linked file

[Rates per 100,000 live births in specified group]

Cause of death (Based on the *International Classification of Diseases, Tenth Revision*, 1992)	All races			Non-Hispanic white			Non-Hispanic black[1]			American Indian[2,3]			Asian or Pacific Islander[4]		
	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate
All causes	...	27,970	695.4	...	13,327	579.9	...	8,031	1,388.6	...	366	864.8	...	1,006	477.2
Congenital malformations, deformations and chromosomal abnormalities. (Q00–Q99)	1	5,630	140.0	1	2,999	130.5	2	987	170.6	1	80	188.1	1	225	106.8
Disorders related to short gestation and low birthweight, not elsewhere classified (P07)	2	4,636	115.3	2	1,769	77.0	1	1,828	316.0	3	46	108.0	2	161	76.4
Sudden infant death syndrome (R95)	3	2,295	57.1	3	1,269	55.2	3	642	110.9	2	52	123.3	4	51	24.3
Newborn affected by maternal complications of pregnancy (P01)[5]	4	1,704	42.4	4	797	34.7	4	548	94.8	4	22	52.6	3	68	32.1
Newborn affected by complications of placenta, cord and membranes (P02)	5	1,013	25.2	5	491	21.3	6	308	53.2	9	7	*	6	32	15.0

Cause of death (Based on the *International Classification of Diseases, Tenth Revision*, 1992)	Total Hispanic			Mexican			Puerto Rican[6]			Central and South American[7]		
	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate
All causes	...	4,927	562.0	...	3,399	541.6	...	471	818.9	...	637	505.6
Congenital malformations, deformations and chromosomal abnormalities. (Q00–Q99)	1	1,277	145.6	1	914	145.6	2	96	166.6	1	172	136.4
Disorders related to short gestation and low birthweight, not elsewhere classified (P07)	2	759	86.6	2	503	80.1	1	97	168.6	2	93	74.1
Sudden infant death syndrome (R95)	3	260	29.7	3	181	28.8	3	31	54.3	5	26	20.8
Newborn affected by maternal complications of pregnancy (P01)[5]	4	241	27.5	4	149	23.8	4	28	48.9	4	27	21.1
Newborn affected by complications of placenta, cord and membranes (P02)	5	158	18.0	5	112	17.8	6	18	*	9	12	*

... Category not applicable.

* Figure does not meet standard of reliability or precision; based on fewer than 20 deaths in the numerator.

[1]For non-Hispanic blacks, Respiratory distress of newborn was the fifth leading cause of death, with 319 deaths and a rate of 55.1.

[2]Includes Aleuts and Eskimos.

[3]For American Indians, Accidents (unintentional injuries) was the fifth leading cause of death; however, with only 16 deaths, a reliable infant mortality rate could not be computed.

[4]For Asian or Pacific Islanders, Diseases of the circulatory system was the fifth leading cause of death, with 34 deaths and a rate of 16.2.

[5]Cause-of-death coding changes may affect comparability with the previous year's data for this cause; see "Technical Notes."

[6]For Puerto Ricans, Respiratory distress of newborn was the fifth leading cause of death, with 20 deaths and a rate of 35.1.

[7]For Central and South Americans, Respiratory distress of newborn was the third leading cause of death, with 32 deaths and a rate of 25.1.

NOTE: Reliable cause-specific infant mortality rates cannot be computed for Cubans because of the small number of infant deaths (53).

Technical Notes

Differences between period and cohort data

From 1983 to 1991 NCHS produced linked files in a birth cohort format (46). Beginning with 1995 data, linked files are produced first using a period format and then subsequently using a birth cohort format (both available on CD ROM). Thus, the 2002 period linked file contains a numerator file that consists of all infant deaths occurring in 2002 that have been linked to their corresponding birth certificates, whether the birth occurred in 2001 or in 2002. In contrast, the 2002 birth cohort linked file will contain a numerator file that consists of all infant deaths to babies born in 2002 whether the death occurred in 2002 or 2003.

For the 2002 file, NCHS accepted birth records that could be linked to infant deaths even if registered after the closure of the 2002 birth file (slightly more than 100 cases). This improved the infant birth/death linkage and made the denominator file distinctly different from the official 2002 birth file.

The release of linked file data in two different formats allows NCHS to meet demands for more timely linked files while still meeting the needs of data users who prefer the birth cohort format. While the birth cohort format has methodological advantages, it creates substantial delays in data availability, since it is necessary to wait until the close of the following data year to include all infant deaths in the birth cohort. Beginning with 1995 data, the period linked file is the basis for all official NCHS linked file statistics.

Weighting

A record weight is added to the linked file to compensate for the 1.0 percent (in 2002) of infant death records that could not be linked to their corresponding birth certificates. This procedure was initiated in 1995. Records for Puerto Rico, the Virgin Islands, and Guam are not weighted. The percentage of records linked varied by registration area (from 93.9 to 100.0 percent with all but three areas—Alaska, Oklahoma, and Texas at 97 percent or higher) (table I). The number of infant deaths in the linked file for the 50 States and the District of Columbia was weighted to equal the sum of the linked plus unlinked infant deaths by State of occurrence at birth and age at death (less than 7 days, 7–27 days, and 28 days to under 1 year). The addition of the weight greatly reduced the potential for bias in comparing infant mortality rates by characteristics.

The 2002 linked file started with 28,016 infant death records. Of these 28,016 records, 27,722 were linked; 294 were unlinked because corresponding birth certificates could not be identified. The 28,016 linked and unlinked records contained 46 records of infants whose mother's usual place of residence is outside of the United States. These 46 records were excluded to derive a weighted total of 27,970 infant deaths. Thus, all total calculations for 2002 in this report used a weighted total of 27,970 infant deaths (tables A, B, D, 1, 2, 6, and 7).

Comparison of infant mortality data between the linked file and the vital statistics mortality file

The overall infant mortality rate from the 2002 period linked file of 7.0 is the same as the 2002 vital statistics mortality file. The number of infant deaths differs slightly; the number in the mortality file

Table I. Percent of infant death records that were linked to their corresponding birth records: United States and each State, Puerto Rico, Virgin Islands, and Guam, 2002 linked file

State	Percent linked by State of occurrence of death
United States[1]	99.0
Alabama	100.0
Alaska	93.9
Arizona	99.6
Arkansas	99.7
California	97.9
Colorado	100.0
Connecticut	100.0
Delaware	100.0
District of Columbia	99.5
Florida	99.6
Georgia	100.0
Hawaii	100.0
Idaho	100.0
Illinois	97.3
Indiana	98.4
Iowa	99.4
Kansas	99.2
Kentucky	99.7
Louisiana	97.5
Maine	98.3
Maryland	99.6
Massachusetts	97.2
Michigan	99.7
Minnesota	100.0
Mississippi	100.0
Missouri	100.0
Montana	98.7
Nebraska	100.0
Nevada	99.5
New Hampshire	100.0
New Jersey	97.9
New Mexico	99.4
New York	99.0
North Carolina	99.9
North Dakota	100.0
Ohio	99.7
Oklahoma	95.8
Oregon	100.0
Pennsylvania	99.7
Rhode Island	100.0
South Carolina	100.0
South Dakota	100.0
Tennessee	99.9
Texas	96.8
Utah	99.3
Vermont	100.0
Virginia	99.7
Washington	99.8
West Virginia	100.0
Wisconsin	100.0
Wyoming	100.0
Puerto Rico	100.0
Virgin Islands	100.0
Guam	100.0

[1]Excludes data for Puerto Rico, Virgin Islands, and Guam.

was 28,034 (2). Differences in numbers of infant deaths between the two data sources can be traced to three different causes:

1. geographic coverage differences
2. additional quality control
3. weighting

Differences in geographic coverage are due to the fact that for the vital statistics mortality file, all deaths occurring in the 50 States and the District of Columbia are included regardless of the place of birth of the infant. In contrast, to be included in the linked file, both the birth and death must occur in the 50 States and the District of Columbia. In addition to the mortality quality control review, the linkage process subjects infant death records to an additional round of quality control (2). Every year, a few records are voided from the file at this stage because they are found to be fetal deaths, deaths at ages over 1 year, or duplicate death certificates. Finally, although every effort has been made to design weights that will accurately reflect the distribution of deaths by characteristics, weighting may contribute to small differences in numbers and rates by specific variables between these two data sets.

Marital status

National estimates of births to unmarried women are based on two methods of determining marital status. In 2002 marital status was based on a direct question in 48 States and the District of Columbia. In the two States (Michigan and New York) that used inferential procedures to compile birth statistics by marital status, a birth is inferred as nonmarital if either of these factors, listed in priority-of-use order, is present: a paternity acknowledgment was received or the father's name is missing. For more information on the inferential procedures and on the changes in reporting, see the "Technical Notes" in *Births: Final Data for 2002* (3).

Period of gestation and birthweight

The primary measure used to determine the gestational age of the newborn is the interval between the first day of the mother's last normal menstrual period (LMP) and the date of birth. It is subject to error for several reasons, including imperfect maternal recall or misidentification of the LMP because of postconception bleeding, delayed ovulation, or intervening early miscarriage. These data are edited for LMP-based gestational ages that are clearly inconsistent with the infant's plurality and birthweight (see below), but reporting problems for this item persist and many occur more frequently among some subpopulations and among births with shorter gestations (47,48).

The U.S. Standard Certificate of Live Birth contains an item, "clinical estimate of gestation," which is compared with length of gestation computed from the date the LMP began when the latter appears to be inconsistent with birthweight. This is done for normal-weight births of apparently short gestations and very-low-birthweight births reported to be full term. The clinical estimate was also used if the LMP date was not reported. The period of gestation for 4.6 percent of the births in 2002 was based on the clinical estimate of gestation. For 97 percent of these records, the clinical estimate was used because the LMP date was not reported. For the remaining 3 percent, the clinical estimate was used because it was consistent with the reported birthweight, whereas the LMP-based gestation was not. In cases where the reported birthweight was inconsistent with both the LMP-computed gestation and the clinical estimate of gestation, the LMP-computed gestation was used and birthweight was re-classified as "not stated." This was necessary for about 284 births or 0.007 percent of all birth records in 2002 (3).

For the linked file, not stated birthweight was imputed for 1,814 records or 0.04 percent of the birth records in 2002 when birthweight was not stated but the period of gestation was known. In this case, birthweight was assigned the value from the previous record with the same period of gestation, maternal race, sex, and plurality. If birthweight and period of gestation were both unknown the not stated value for birthweight was retained. This imputation was done to improve the accuracy of birthweight-specific infant mortality rates, since the percentage of records with not stated birthweight was higher for infant deaths (3.85 percent before imputation) than for live births (0.07 percent before imputation). The imputation reduced the percent of not stated records to 1.42 percent for infant deaths, and 0.04 percent for births. The not stated birthweight cases in the natality/birth file, as distinct from the linked file, are not imputed (3).

Cause-of-death classification

The mortality statistics presented in this report were compiled in accordance with the World Health Organization (WHO) regulations, which specify that member nations classify and code causes of death in accordance with the current revision of the *International Statistical Classification of Diseases and Related Health Problems* (ICD). The ICD provides the basic guidance used in virtually all countries to code and classify causes of death. The ICD not only details disease classification but also provides definitions, tabulation lists, the format of the death certificate, and the rules for coding cause of death. Cause-of-death data presented in this report were coded by procedures outlined in annual issues of the *NCHS Instruction Manual* (49,50).

In this report tabulations of cause-of-death statistics are based solely on the underlying cause of death. The underlying cause is defined by WHO as "the disease or injury which initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury" (4). It is selected from the conditions entered by the physician in the cause-of-death section of the death certificate. When more than one cause or condition is entered by the physician, the underlying cause is determined by the sequence of conditions on the certificate, provisions of the ICD, and associated selection rules and modifications. Generally, more medical information is reported on death certificates than is directly reflected in the underlying cause of death. This is captured in NCHS multiple cause-of-death statistics (51,52).

About every 10 to 20 years, the ICD is revised to take into account advances in medical knowledge. Effective with deaths occurring in 1999, the United States began using the Tenth Revision of the ICD (4); during the period 1979–98, causes were coded and classified according to the Ninth Revision of the ICD (5).

Changes in classification of causes of death due to these revisions may result in discontinuities in cause-of-death trends. Measures of this discontinuity are essential to the interpretation of mortality trends, and are discussed in detail in other NCHS publications (2,53).

Maternal complications—In addition to changes due to the implementation of a new ICD revision, rules for coding a cause of death may

occasionally require modification at other times, when evidence suggests that such modifications will improve the quality of cause-of-death data. These changes may affect comparability of data between years for select causes of death. For example, between 2001 and 2002 a change in the coding rules was implemented that resulted in some deaths that would have previously been assigned to Atelectasis, instead being assigned to maternal complications. This change accounts for part (about one-half) of the large increase in maternal complications from 2001–02 (2).

Tabulation lists and cause-of-death ranking

The cause-of-death rankings for ICD–10 are based on the List of 130 Selected Causes of Infant Death. The tabulation lists and rules for ranking leading causes of death are published in the *NCHS Instruction Manual*, Part 9, "ICD–10 Cause-of-Death Lists for Tabulating Mortality Statistics, Effective 1999" (54). Briefly, category titles that begin with the words "Other" and "All other" are not ranked to determine the leading causes of death. When one of the titles that represents a subtotal is ranked (for example, Influenza and pneumonia (J10–J18)), its component parts are not ranked (in this case, Influenza (J10–J11) and Pneumonia (J12–18)).

Computation of rates

Infant mortality rates are the most commonly used index for measuring the risk of dying during the first year of life. For the linked birth/infant death data set they are calculated by dividing the number of infant deaths in a calendar year by the number of live births registered for the same period and are presented as rates per 1,000 or per 100,000 live births. Both the mortality file and the linked birth/infant death file use this computation method but due to unique numbers of infant deaths, as explained in the section above on the comparison of these two files, the rates will often differ for specific variables (particularly for race and ethnicity). Infant mortality rates use the number of live births in the denominator to approximate the population at risk of dying before the first birthday. In contrast to the infant mortality rates based on live births, infant death rates, used only in age-specific death rates with the mortality file, use the estimated population of persons under 1 year of age as the denominator. For all variables, not stated responses were shown in tables of frequencies, but were dropped before rates were computed.

As stated previously, infant death records for the 50 States and the District of Columbia in the linked file are weighted so that the infant mortality rates are not underestimated for those areas that did not successfully link all records.

Random variation in infant mortality rates

The number of infant deaths and live births reported for an area represent complete counts of such events. As such, they are not subject to sampling error, although they are subject to nonsampling error in the registration process. However, when the figures are used for analytic purposes, such as the comparison of rates over time, for different areas, or among different subgroups, the number of events that actually occurred may be considered as one of a large series of possible results that could have arisen under the same circumstances (55). As a result, numbers of births, deaths, and infant mortality rates are subject to random variation. The probable range of values may be estimated from the actual figures according to certain statistical assumptions.

In general, distributions of vital events may be assumed to follow the binomial distribution. When the number of events is large, the relative standard error is usually small. When the number of events is small (perhaps fewer than 100) and the probability of such an event is small, considerable caution must be observed in interpreting the data. Such infrequent events may be assumed to follow a Poisson probability distribution (2). Estimates of relative standard errors (RSEs) and 95-percent confidence intervals are shown below.

The formula for the RSE of infant deaths and live births is:

$$\mathrm{RSE}(D) = 100 \bullet \sqrt{\frac{1}{D}}$$

where D is the number of deaths and

$$\mathrm{RSE}\,(B) = 100 \bullet \sqrt{\frac{1}{B}}$$

where B is the number of births.

For example, let us say that for group A the number of infant deaths was 112 while the number of live births was 28,560, yielding an infant mortality rate of 3.9 infant deaths per 1,000 live births.

$$\text{The RSE of the deaths} = 100 \bullet \sqrt{\frac{1}{112}} = 9.45,$$

$$\text{while the RSE of the births} = 100 \bullet \sqrt{\frac{1}{28{,}560}} = 0.59.$$

The formula for the RSE of the infant mortality rate (IMR) is:

$$\mathrm{RSE(IMR)} = 100 \bullet \sqrt{\frac{1}{D} + \frac{1}{B}}$$

$$\text{The RSE of the IMR} = 100 \bullet \sqrt{\frac{1}{112} + \frac{1}{28{,}560}} = 9.47.$$

Binomial distribution—When the number of events is greater than 100, the binomial distribution is used to estimate the 95-percent confidence intervals as follows:

$$\text{Lower: } R_1 - 1.96 \bullet R_1 \bullet \frac{\mathrm{RSE}(R_1)}{100}$$

$$\text{Upper: } R_1 + 1.96 \bullet R_1 \bullet \frac{\mathrm{RSE}(R_1)}{100}$$

Thus, for group A:

$$\text{Lower: } 3.9 - \left(1.96 \bullet 3.9 \bullet \frac{9.47}{100}\right) = 3.2$$

$$\text{Upper: } 3.9 + \left(1.96 \bullet 3.9 \bullet \frac{9.47}{100}\right) = 4.6$$

Thus the chances are 95 out of 100 that the true IMR for group A lies somewhere in the 3.2 to 4.6 interval.

Poisson distribution—When the number of events in the numerator is less than 100 the confidence interval for the rate can be estimated based on the Poisson distribution using the values in table II.

Lower: IMR • L (.95, D_{adj})

Upper: IMR • U (.95, D_{adj})

where D_{adj} is the adjusted number of infant deaths (rounded to the nearest integer) used to take into account the RSE of the number of infant deaths and live births, and is computed as follows:

$$D_{adj} = \frac{D \bullet B}{D + B}$$

L (.95, D_{adj}) and U (.95, D_{adj}) refer to the values in table II corresponding to the value of D_{adj}.

For example, let us say that for group B the number of infant deaths was 58, the number of live births was 9,801, and the infant mortality rate was 5.9.

$$D_{adj} = \frac{(58 \bullet 9{,}801)}{(58 + 9{,}801)} = 58$$

Therefore the 95-percent confidence interval (using the formula in table II for 1–99 infant deaths) =

Lower: 5.9 • 0.75934 = 4.5

Upper: 5.9 • 1.29273 = 7.6

Comparison of two infant mortality rates—If either of the two rates to be compared is based on less than 100 deaths, compute the confidence intervals for both rates and check to see if they overlap. If

Table II. Values of *L* and *U* for calculating 95-percent confidence limits for numbers of events and rates when the number of events is less than 100

N	L	U	N	L	U
1	0.02532	5.57164	51	0.74457	1.31482
2	0.12110	3.61234	52	0.74685	1.31137
3	0.20622	2.92242	53	0.74907	1.30802
4	0.27247	2.56040	54	0.75123	1.30478
5	0.32470	2.33367	55	0.75334	1.30164
6	0.36698	2.17658	56	0.75539	1.29858
7	0.40205	2.06038	57	0.75739	1.29562
8	0.43173	1.97040	58	0.75934	1.29273
9	0.45726	1.89831	59	0.76125	1.28993
10	0.47954	1.83904	60	0.76311	1.28720
11	0.49920	1.78928	61	0.76492	1.28454
12	0.51671	1.74680	62	0.76669	1.28195
13	0.53246	1.71003	63	0.76843	1.27943
14	0.54671	1.67783	64	0.77012	1.27698
15	0.55969	1.64935	65	0.77178	1.27458
16	0.57159	1.62394	66	0.77340	1.27225
17	0.58254	1.60110	67	0.77499	1.26996
18	0.59266	1.58043	68	0.77654	1.26774
19	0.60207	1.56162	69	0.77806	1.26556
20	0.61083	1.54442	70	0.77955	1.26344
21	0.61902	1.52861	71	0.78101	1.26136
22	0.62669	1.51401	72	0.78244	1.25933
23	0.63391	1.50049	73	0.78384	1.25735
24	0.64072	1.48792	74	0.78522	1.25541
25	0.64715	1.47620	75	0.78656	1.25351
26	0.65323	1.46523	76	0.78789	1.25165
27	0.65901	1.45495	77	0.78918	1.24983
28	0.66449	1.44528	78	0.79046	1.24805
29	0.66972	1.43617	79	0.79171	1.24630
30	0.67470	1.42756	80	0.79294	1.24459
31	0.67945	1.41942	81	0.79414	1.24291
32	0.68400	1.41170	82	0.79533	1.24126
33	0.68835	1.40437	83	0.79649	1.23965
34	0.69253	1.39740	84	0.79764	1.23807
35	0.69654	1.39076	85	0.79876	1.23652
36	0.70039	1.38442	86	0.79987	1.23499
37	0.70409	1.37837	87	0.80096	1.23350
38	0.70766	1.37258	88	0.80203	1.23203
39	0.71110	1.36703	89	0.80308	1.23059
40	0.71441	1.36172	90	0.80412	1.22917
41	0.71762	1.35661	91	0.80514	1.22778
42	0.72071	1.35171	92	0.80614	1.22641
43	0.72370	1.34699	93	0.80713	1.22507
44	0.72660	1.34245	94	0.80810	1.22375
45	0.72941	1.33808	95	0.80906	1.22245
46	0.73213	1.33386	96	0.81000	1.22117
47	0.73476	1.32979	97	0.81093	1.21992
48	0.73732	1.32585	98	0.81185	1.21868
49	0.73981	1.32205	99	0.81275	1.21746
50	0.74222	1.31838			

so, the difference is not statistically significant at the 95-percent level. If they do not overlap, the difference is statistically significant. If both of the two rates (R_1 and R_2) to be compared are based on 100 or more deaths, the following z-test may be used to define a significance test statistic:

$$z = \frac{R_1 - R_2}{\sqrt{R_1^2\left(\frac{\mathrm{RSE}(R_1)}{100}\right)^2 + R_2^2\left(\frac{\mathrm{RSE}(R_2)}{100}\right)^2}}$$

If $|z| \geq 1.96$, then the difference is statistically significant at the 0.05 level and if $|z| < 1.96$, the difference is not significant.

Availability of linked file data

Linked file data are available on CD ROM from the National Center for Health Statistics (NCHS) at 1–866-441–6247. Data are also available in selected issues of the *Vital and Health Statistics*, Series 20 reports, the *National Vital Statistics Reports* (formerly the *Monthly Vital Statistics Report*) through NCHS. Additional unpublished tabulations are available from NCHS through the Internet site at http://www.cdc.gov/nchs. Selected variables from the linked file are also available for tabulation on CDC WONDER at http://wonder.cdc.gov/lbdJ.html.

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TECHNICAL APPENDIX FROM

VITAL STATISTICS OF THE UNITED STATES

2002

NATALITY

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CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL CENTER FOR HEALTH STATISTICS
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Introduction

This report, published by the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS), is an updated and abridged version of the "1999 Technical Appendix" and focuses on information for the 2002 data file (1). This "Appendix" is also included in "Vital Statistics of the United States, 2002, Volume I, Natality" (in preparation). Reference will be made to the "1999 Technical Appendix" for historical discussion of the variables, definitions, quality, and completeness of the birth data (2). This report supplements the "Technical Notes" section of "Births: Final data for 2002" (3) and is recommended for use with the public-use file for 2002 births, available on CD-ROM from NCHS, and the tabulated data of "Vital Statistics of the United States, 2002, Volume I, Natality."

Definition of Live Birth

Every product of conception that gives a sign of life after birth, regardless of the length of the pregnancy, is considered a live birth. This concept is included in the definition set forth by the World Health Organization in 1950 and revised in 1988 by a working group formed by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists (4–6):

> Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn.

This definition distinguishes in precise terms a live birth from a fetal death (see section on fetal deaths in the "Technical Appendix" of "Vital Statistics of the United States, Volume II"). In the interest of comparable natality statistics, both the Statistical Commission of the United Nations and NCHS have adopted this definition (7,8).

History of Birth-Registration Area

Currently the birth-registration system of the United States covers the 50 States, the District of Columbia, the independent registration area of New York City, and Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands (referred to as Northern Marianas). However, in the statistical tabulations, "United States" refers only to the aggregate of the 50 States (including New York City) and the District of Columbia. Information on the history and development of the birth-registration area is available elsewhere (2).

Sources of Data

Natality statistics

Since 1985 natality statistics for all States and the District of Columbia have been based on information from the total file of records. The information is received on electronic files of individual records processed by the States and provided to NCHS through the Vital Statistics Cooperative Program. NCHS receives these files from the registration offices of all States, the District of Columbia, and New York City. Information for Puerto Rico and the Virgin Islands is also received through the Vital Statistics Cooperative Program. Information for Guam, American Samoa, and the Northern Marianas is obtained from microfilm copies of original birth certificates and is based on the total file of records for all years. Data from American Samoa first became available in 1997. Data from the Northern Marianas first became available in 1998.

U.S. natality data are limited to births occurring within the United States, including those occurring to U.S. residents and nonresidents. Births to nonresidents of the United States have been excluded from all tabulations by place of residence beginning in 1970 (for further discussion see "Classification by occurrence and residence"). Births occurring to U.S. citizens outside the United States are not included in any tabulation in this report. Data for Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Northern Marianas are limited to births registered in these areas.

Standard certificate of live birth

The U.S. Standard Certificate of Live Birth, issued by the Public Health Service, has served for many years as the principal means of attaining uniformity in the content of the documents used to collect information on births in the United States. It has been modified in each State to the extent required by the particular State's needs or by special provisions of the State's vital statistics law. However, most State certificates conform closely in content to the standard certificate.

1989 revision—Effective January 1, 1989, a revised U.S. Standard Certificate of Live Birth (figure 4–A) replaced the 1978 revision. This revision provided a wide variety of new information on maternal and infant health characteristics, representing a significant departure from previous versions in both content and format. The most significant format change was the use of checkboxes to obtain detailed medical and health information about the mother and child. Details of the nature and content of the 1989 revision are available elsewhere (2).

Classification of Data

One of the principal values of vital statistics data is realized through the presentation of rates that are computed by relating the vital events of a class to the population of a similarly defined class. Vital statistics and population statistics, therefore, must be classified according to similarly defined systems and tabulated in comparable groups. Even when the variables common to both, such as geographic area, age, race, and sex, have been similarly classified and tabulated, significant discrepancies may result from differences between the enumeration method of obtaining population data and the registration method of obtaining vital statistics data.

The general rules used to classify geographic and personal items for live births are set

forth in "Vital Statistics Classification and Coding Instructions for Live Birth Records, 1999–2001," *NCHS Instruction Manual*, Part 3a (9). This material is incorporated in the basic file layout on the CD-ROM (1). The instruction materials are for States to use in coding the data items; they do not include any NCHS recodes. Therefore, the file layout is a better source of information on the code structure because it provides the exact codes and recodes that are available. Classification of certain important items is discussed in the following pages. Information on the completeness of reporting of birth certificate data is shown in table A, which presents a listing of items and the percentage of records that were not stated for each State, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Northern Marianas.

Classification by occurrence and residence

In tabulations by place of residence, births occurring within the United States to U.S. citizens and to resident aliens are allocated to the usual place of residence of the mother in the United States, as reported on the birth certificate. Beginning in 1970, births to nonresidents of the United States occurring in the United States are excluded from these tabulations. Births to U.S. residents occurring outside this country are not included in tabulations by place of residence.

The total count of births for the United States by place of residence and by place of occurrence will not be identical. Births to nonresidents of the United States are included in data by place of occurrence but excluded from data by place of residence, as previously indicated. See table B for the number of births by residence and occurrence for the 50 States and the District of Columbia for 2002.

Residence error—A nationwide test of birth-registration completeness in 1950 provided measures of residence error for natality statistics. According to the 1950 test (which has not been repeated), errors in residence reporting for the country as a whole tend to overstate the number of births to residents of urban areas and to understate the number of births to residents of other areas (10). Recent experience demonstrates that this is still a concern based on anecdotal evidence from the States. This tendency has assumed special importance because of a concomitant development—the increased utilization of hospitals in cities by residents of nearby places—with the result that a number of births are erroneously reported as having occurred to residents of urban areas. Another factor that contributes to this overstatement of urban births is the customary practice of using city addresses for persons living outside the city limits. Residence error should be taken into consideration in interpreting data for small areas and for cities. Both birth and infant mortality patterns can be affected.

Incomplete residence—Beginning in 1973 where only the State of residence is reported with no city or county specified and the State named is different from the State of occurrence, the birth is allocated to the largest city of the State of residence. Before 1973, such births were classified according to the exact place of occurrence.

Geographic classification

The rules followed in the classification of geographic areas for live births are contained in the instruction manual mentioned previously. The geographic code structure for 2002 is given in another manual, "Vital Records Geographic Classification, 1995," *NCHS Instruction Manual*, Part 8, which is included with the documentation file on CD-ROM (1). The geographic code structure in 2002 is based on results of the 1990 Census of Population.

United States—In the statistical tabulations, "United States" refers only to the aggregate of the 50 States and the District of Columbia. Alaska has been included in the U.S. tabulations

since 1959 and Hawaii since 1960.

Details of the classification of births for metropolitan statistical areas, metropolitan and nonmetropolitan counties, and population size groups for cities and urban places are presented elsewhere (2).

Places with a population of less than 100,000 are not separately identified on the public-use file because of confidentiality limitations.

Race or national origin

Beginning with the 1989 data year, birth data are tabulated primarily by race of mother. Since 1989 the criteria for reporting the race of the parents has not changed and continues to reflect the response of the informant (usually the mother). Beginning with the 1992 issue of "Vital Statistics of the United States, Volume I, Natality," trend data for years beginning with 1980 have been retabulated by race of mother. The factors influencing the decision to tabulate births by race of the mother have been discussed in detail elsewhere (2,11). Information on tabulation procedures for data by race prior to 1989 is presented elsewhere (2). The change in the tabulation of births by race presents some problems when analyzing birth data by race, particularly trend data. The problem is likely to be acute for races other than white and black.

The categories for race or national origin are "White," "Black," "American Indian" (including Aleuts and Eskimos), "Chinese," "Japanese," "Hawaiian," "Filipino," and "Other Asian or Pacific Islander" (including Asian Indian). Before 1992, there was also an "Other" category, which is now combined with the "Not stated" category. Before 1978, the category "Other Asian or Pacific Islander" was not identified separately but included with "Other" races. The separation of this category from "Other" allows for identification of the category "Asian or Pacific Islander" by combining the new category "Other Asian or Pacific Islander" with Chinese, Japanese, Hawaiian, and Filipino.

Since 1992 States with the largest Asian or Pacific Islander (API) populations have provided NCHS with data for additional API subgroups. The API subgroups include Vietnamese, Asian Indian, Korean, Samoan, Guamanian, and other API women. In 2002, 11 States were included in this reporting area: California, Hawaii, Illinois, Minnesota, Missouri, New Jersey, New York, Texas, Virginia, Washington, and West Virginia. At least two-thirds of the U.S. population of each of these additional API groups lived in the 11-State reporting area (12). The data are available on the detailed natality tapes and CD-ROMs beginning with the 1992 data year. An analytic report based on the 1992 data year is also available upon request (13).

If the race or national origin of an Asian parent is ill-defined or not clearly identifiable with one of the categories used in the classification (for example, if "Oriental" is entered), an attempt is made to determine the specific race or national origin from the entry for place of birth. If the birthplace is China, Japan, or the Philippines, the race of the parent is assigned to that category. When race cannot be determined from birthplace, it is assigned to the category "Other Asian or Pacific Islander."

Hispanic origin and race are reported independently on the birth certificate. Data for Hispanic subgroups are shown in most cases for four specific groups: Mexican, Puerto Rican, Cuban, Central and South American; and an additional subgroup: "Other and unknown Hispanic." More specific Hispanic origin information for the "Other and unknown Hispanic" category is not available. In tabulations of birth data by race only, data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race. The category "White" comprises births reported as white and births where race, as distinguished from

Hispanic origin, is reported as Hispanic. In tabulations of birth data by race and Hispanic origin, data for persons of Hispanic origin are not further classified by race because the vast majority of births to Hispanic women are reported as white (98 percent in 2002). In these tabulations, data for non-Hispanic persons are classified according to the race of the mother because there are substantial differences in fertility and maternal and infant health between Hispanic and non-Hispanic white women. A recode variable is available that provides cross tabulations of race by Hispanic origin.

Race or national origin not stated—If the race of the mother is not defined or not identifiable with one of the categories used in the classification (0.5 percent of births in 2002) and the race of the father is known, the race of the father is assigned to the mother. If information for both parents is missing, the race of the mother is allocated according to the specific race of the mother on the preceding record with a known race of mother. Data for both parents were missing for only 0.3 percent of birth certificates for 2002. Nearly all statistics by race or national origin for the United States as a whole in 1962 and 1963 are affected by a lack of information for New Jersey, which did not report the race of the parents in those years. Birth rates by race for those years are computed on a population base that excluded New Jersey. For the method of estimating the U.S. population by age, sex, and race excluding New Jersey in 1962 and 1963, see page 4-8 in the "Technical Appendix" of "Vital Statistics of the United States, Volume I, 1963." The percentage of records for which Hispanic origin of the parents was not reported in 2002 is shown by State in table A.

Age of mother

Beginning in 1989 a "Date of birth" item on the birth certificate replaced the "Age (at time of this birth)" item. Not all States revised this item, and, therefore, the age of mother either is derived from the reported month and year of birth or coded as stated on the certificate. In 2002 age of mother was reported directly by five States (Kentucky, Nevada, North Dakota, Virginia, and Wyoming) and American Samoa. From 1964 to 1996 age of mother was considered not stated and therefore imputed for ages under 10 years or 50 years and over. Beginning in 1997 age of mother was considered not stated and imputed for ages under 10 years or 55 years and over. The numbers of births to women aged 50–54 years are too small for computing age–specific birth rates. These births have been included with births to women aged 45–49 years for computing birth rates.

Age–specific birth rates are based on populations of women by age, prepared by the U.S. Census Bureau. In census years the decennial census counts are used. In intercensal years, estimates of the population of women by age are published by the U.S. Census Bureau in *Current Population Reports*. The 2000 Census of Population derived age in completed years as of April 1, 2000, from responses to questions on age at last birthday and month and year of birth, with the latter given preference. In the 1960, 1970, 1980, and 1990 Census of Population, age was also derived from month and year of birth. Age in completed years was asked in censuses before 1960. This was nearly the equivalent of the former birth certificate question, which the 1950 test of matched birth and census records confirms by showing a high degree of consistency in reporting age in these two sources (14). More recently, reporting of maternal age on the birth certificate was compared with reporting of age in a survey of women who had recently given birth. Reporting of age was very consistent between the two sources (15).

Median age of mother—Median age is the value that divides an age distribution into two equal parts, one-half of the values being less and one-half being greater. Median ages of mothers

for 1960 to the present have been computed from birth rates for 5–year age groups rather than from birth frequencies. This method eliminates the effects of changes in the age composition of the childbearing population over time. Changes in the median ages from year to year can thus be attributed solely to changes in the age–specific birth rates. Trend data on the median age is shown in table 1–5 of "Vital Statistics of the United States, Volume 1, Natality" (at http://www.cdc.gov/nchs/datawh/statab/unpubd/natality/natab99.htm).

Not stated date of birth of mother– In 2002 age of mother was not reported on 0.01 percent of the records. Beginning in 1964 birth records with date of birth of mother and/or age of mother not stated have had age imputed according to the age of mother from the previous birth record of the same race and total-birth order (total of fetal deaths and live births). (See "Computer Edits for Natality Data, Effective 1993" *NCHS Instruction Manual*, Part 12, page 9) (16). Editing procedures for 1963 and earlier years are described elsewhere (2).

Age of father

Age of father is derived from the reported date of birth or coded as stated on the birth certificate. If the age is under 10 years, it is considered not stated and grouped with those cases for which age is not stated on the certificate. Information on age of father is often missing on birth certificates of children born to unmarried mothers, greatly inflating the number in the "Not stated" category in all tabulations by age of father. In computing birth rates by age of father, births tabulated as age of father not stated are distributed in the same proportions as births with known age within each 5–year-age classification of the mother. This procedure is followed because, while father's age is missing in 13 percent of the birth certificates in 2002, 25 percent of these were on records where the mother is a teenager. This distribution procedure is done separately by race. The resulting distributions are summed to form a composite frequency distribution that is the basis for computing birth rates by age of father. This procedure avoids the distortion in rates that would result if the relationship between age of mother and age of father were disregarded. Births with age of father not stated are distributed only for rates, not for frequency tabulations (3).

Live-birth order and parity

Live-birth order and parity classifications refer to the total number of live births the mother has had including the 2002 birth. Fetal deaths are excluded.

Live-birth order indicates what number the present birth represents; for example, a baby born to a mother who has had two previous live births (even if one or both are not now living) has a live-birth order of three. Parity indicates how many live births a mother has had. Before delivery a mother having her first baby has a parity of zero, and a mother having her third baby has a parity of two. After delivery the mother of a baby who is a first live birth has a parity of one, and the mother of a baby who is a third live birth has a parity of three.

Live-birth order and parity are determined from two items on the birth certificate, "Live births now living" and "Live births now dead." Editing procedures for live birth order are summarized elsewhere (2,16).

Not stated birth order–All births tabulated in the "Not stated birth order" category are excluded from the computation of percentages. In computing birth rates by live-birth order, births tabulated as birth order not stated are distributed in the same proportion as births of known live-birth order.

Educational attainment

National data on educational attainment are currently available only for the mother (2). Beginning in 1995, NCHS ceased to collect information on the educational attainment of the father.

The educational attainment of the mother is defined as the number of years of school completed. Only those years completed in regular schools are counted, that is, a formal educational system of public schools or the equivalent in accredited private or parochial schools. Business or trade schools, such as beauty and barber schools, are not considered regular schools for the purposes of this item. No attempt has been made to convert years of school completed in foreign school systems, ungraded school systems, and so forth, to equivalent grades in the American school system. Such entries are included in the "Not stated" category.

Women who have completed only a partial year in high school or college are tabulated as having completed the highest preceding grade. For those certificates on which a specific degree is stated, years of school completed is coded to the level at which the degree is most commonly attained; for example, women reporting B.A., A.B., or B.S. degrees are considered to have completed 16 years of school.

Education not stated—The "Not stated" category includes all records in reporting areas for which there is no information on years of school completed as well as all records for which the information provided is not compatible with coding specifications.

Births tabulated as education not stated are excluded from the computations of percentages.

Marital status

National estimates of births to unmarried women are based on two methods of determining marital status. For 1994 through 1996 birth certificates in 45 States and the District of Columbia included a question about the mother's marital status. Beginning in 1997, the marital status of women giving birth in California and Nevada is determined by a direct question in the birth registration process. Beginning June 15, 1998, Connecticut discontinued inferring the mother's marital status and added a direct question on mother's marital status to the State's birth certificate.

In the two States (Michigan and New York) which used inferential procedures to compile birth statistics by marital status in 2002, a birth is inferred as nonmarital if any of these factors, listed in priority-of-use order, is present: a paternity acknowledgment was received or the father's name is missing. In recent years, a number of States have extended their efforts to identify the fathers when the parents are not married in order to enforce child support obligations. The presence of a paternity acknowledgment, therefore, is the most reliable indicator that the birth is nonmarital in the States not reporting this information directly; this is now the key indicator in the nonreporting States. Details of the changes in reporting procedures are described in previous reports (17,18).

The procedures for reporting marital status in California, Nevada, and New York City changed beginning January 1, 1997, and in Connecticut on June 15, 1998. The methods used to determine marital status and the impact of the procedures on the data were discussed in detail in a previous report (17).

The mother's marital status was not reported in 2002 on 0.03 percent of the birth records in the 48 States and the District of Columbia where this information is obtained by a direct question. Marital status was imputed as married for these records.

When births to unmarried women are reported as second or higher order births, it is not known whether the mother was married or unmarried when the previous deliveries occurred because her marital status at the time of these earlier births is not available from the birth record.

Place of delivery and attendant at birth

The 1989 revision of the U.S. Standard Certificate of Live Birth included separate categories for freestanding birthing centers, the mother's residence, and clinic or doctor's office as the place of birth. Beginning in 1989 births occurring in clinics and in birthing centers not attached to a hospital are classified as "Not in hospital." This change in classification may account in part for the lower proportion of "In hospital" births compared with previous years. (The change in classification of clinics should have minor impact because comparatively few births occur in these facilities, but the effect of any change in classification of freestanding birthing centers is unknown.)

Beginning in 1975 the attendant at birth and place of delivery items were coded independently, primarily to permit the identification of the person in attendance at hospital deliveries. Additional information on these items is presented elsewhere (2).

Babies born on the way to or on arrival at the hospital are classified as having been born in the hospital. This may account for some of the hospital births not delivered by physicians or midwives. The "Not in hospital" category includes births for which no information is reported on place of birth.

In 2000 Illinois started collecting data on certified nurse-midwives (CNM) and making corrections for "Other midwife" and "Other" categories. Data for earlier years were incomplete for Illinois births. As a result, the number of CNMs has significantly increased while the number of "Other midwife" has sharply decreased compared to earlier years.

Procedures in some hospitals may require that a physician be listed as the attendant for every birth and that a physician sign each birth certificate, even if the birth is attended by a midwife and no physician is physically present. Therefore, the number of live births attended by midwives may be understated in some areas.

Birthweight

In some areas birthweight is reported in pounds and ounces rather than in grams. However, the metric system has been used in tabulating and presenting the statistics to facilitate comparison with data published by other groups. The categories for birthweight were changed in 1979 to be consistent with the recommendations in the *International Classification of Diseases, Ninth Revision* (ICD–9) and remain the same for the *International Classification of Diseases, Tenth Revision* (ICD–10) (5). The categories in gram intervals and their equivalents in pounds and ounces are as follows:

Less than 500 grams = 1 lb 1 oz or less
500–999 grams = 1 lb 2 oz–2 lb 3 oz
1,000–1,499 grams = 2 lb 4 oz–3 lb 4 oz
1,500–1,999 grams = 3 lb 5 oz–4 lb 6 oz
2,000–2,499 grams = 4 lb 7 oz–5 lb 8 oz
2,500–2,999 grams = 5 lb 9 oz–6 lb 9 oz
3,000–3,499 grams = 6 lb 10 oz–7 lb 11 oz
3,500–3,999 grams = 7 lb 12 oz–8 lb 13 oz

4,000–4,499 grams = 8 lb l4 oz–9 lb l4 oz
4,500–4,999 grams = 9 lb 15 oz–11 lb 0 oz
5,000 grams or more = 11 lb l oz or more

ICD–9 and ICD–10 define low birthweight as less than 2,500 grams. This is a shift of 1 gram from the previous criterion of 2,500 grams or less, which was recommended by the American Academy of Pediatrics in 1935 and adopted in 1948 by the World Health Organization in the *International Lists of Diseases and Causes of Death, Sixth Revision*.

After data classified by pounds and ounces are converted to grams, median weights are computed and rounded before publication. To establish the continuity of class intervals needed to convert pounds and ounces to grams, the end points of these intervals are assumed to be half an ounce less at the lower end and half an ounce more at the upper end. For example, 2 lb 4 oz–3 lb 4 oz is interpreted as 2 lb 3 ½ oz–3 lb 4 ½ oz.

Births for which birthweight is not reported are excluded from the computation of percentages and medians.

Period of gestation

The period of gestation is defined as beginning with the first day of the last normal menstrual period (LMP) and ending with the day of the birth. The LMP is used as the initial date because it can be more accurately determined than the date of conception, which usually occurs 2 weeks after the LMP.

Births occurring before 37 completed weeks of gestation are considered to be preterm or premature for purposes of classification. At 37–41 weeks gestation, births are considered to be term, and at 42 completed weeks and over, postterm. These distinctions are according to the ICD–9 and ICD–10 (5) definitions.

The 1989 revision of the U.S. Standard Certificate of Live Birth included a new item, "Clinical estimate of gestation" that is being compared with length of gestation computed from the LMP date when the latter appears to be inconsistent with birthweight. This is done for normal weight births of apparently short gestations and very low birthweight births reported to be full term. The use of the clinical estimate in the 2002 data file is described in the "Technical Notes" of "Births: Final data for 2002" (3).

Before 1981, the period of gestation was computed only when there was a valid month, day, and year of LMP. However, length of gestation could not be determined from a substantial number of live-birth certificates each year because the day of LMP was missing. Beginning in 1981, weeks of gestation have been imputed for records with missing day of LMP when there is a valid month and year. The imputation procedure and its effect on the data are described elsewhere (2,19).

Because of postconception bleeding or menstrual irregularities, the presumed date of LMP may be in error. In these instances, the computed gestational period may be longer or shorter than the true gestational period, but the extent of such errors is unknown.

Month of pregnancy prenatal care began

If the name of the month is entered for this item, instead of first, second, third, and so forth, the month of pregnancy in which prenatal care began is determined from the month named and the month last normal menses began. For these births, if the date last normal menses began is not stated, the month of pregnancy in which prenatal care began is tabulated as not stated.

Number of prenatal visits

Tabulations of the number of prenatal visits were presented for the first time in 1972. Beginning in 1989 these data were collected from the birth certificates of all States. Percentage distributions and the median number of prenatal visits exclude births to mothers who had no prenatal care.

Apgar score

The 1– and 5–minute Apgar scores were added to the U.S. Standard Certificate of Live Birth in 1978 to evaluate the condition of the newborn infant at 1 and 5 minutes after birth. The Apgar score is a useful measure of the need for resuscitation and a predictor of the infant's chances of surviving the first year of life. It is a summary measure of the infant's condition based on heart rate, respiratory effort, muscle tone, reflex irritability, and color. Each of these factors is given a score of 0, 1, or 2; the sum of these 5 values is the Apgar score, which ranges from 0 to 10. A score of 10 is optimum, and a low score raises some concerns about the potential survival and subsequent health of the infant. Beginning in 1995, NCHS collected information only on the 5–minute Apgar score. Since 1991, the reporting area for the 5–minute Apgar score has been comprised of 48 States and the District of Columbia, accounting for 77 percent of all births in the United States in 2002. California and Texas did not have information on Apgar scores on their birth certificates.

Tobacco and alcohol use during pregnancy

The checkbox format allows for classification of a mother as a smoker or drinker during pregnancy and for reporting the average number of cigarettes smoked per day or drinks consumed per week. Procedures for determining the consistency between smoking and/or drinking status and the quantity of cigarettes or drinks reported are described elsewhere (2).

Information on smoking and drinking status was reported by 49 States and the District of Columbia (not available for California), accounting for 87 percent of U.S. births in 2002. Information on number of cigarettes smoked per day was reported in a consistent manner for 46 States, the District of Columbia, and New York City (figure 4–A). Indiana and New York State (except for New York City) reported this information but in a format that was inconsistent with NCHS standards. Information was not available for California and South Dakota. The areas reporting on the number of cigarettes smoked comprised 81 percent of U.S. births in 2002.

Weight gain during pregnancy

Weight gain is reported in pounds. A loss of weight is reported as zero gain. Computations of median weight gain were based on ungrouped data. This item was included on the certificates of 49 States and the District of Columbia; California did not report this information. This reporting area, excluding California, accounted for 87 percent of all births in the United States in 2002.

Medical risk factors for this pregnancy

An item on medical risk factors was included on the 1989 birth certificate, but 2 States did not report all of the 16 risk factors in 2002. Texas did not report genital herpes or uterine bleeding, and Kansas did not report Rh sensitization.

The format allows for the designation of more than one risk factor and includes a choice of "None." Accordingly, if the item is not completed, it is classified as not stated.

Definitions adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials for the Association for Vital Records and Health Statistics are available elsewhere (3).

Obstetric procedures

This item includes six specific obstetric procedures. Birth records with "Obstetric procedures" left blank are considered not stated. Data on obstetric procedures were reported by all States and the District of Columbia in 2002.

Definitions adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials for the National Association for Public Health Statistics and Information Systems (NAPHSIS), formerly the Association for Vital Records and Health Statistics, are available elsewhere (3).

Complications of labor and/or delivery

The checkbox format allows for the selection of 15 specific complications and for the designation of more than one complication where appropriate. A choice of "None" is also included. Accordingly, if the item is not completed, it is classified as not stated.

All States and the District of Columbia included this item on their birth certificates in 2002. However, Texas did not report anesthetic complications or fetal distress.

Definitions adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials are available elsewhere (3).

Abnormal conditions of the newborn

This item provides information on eight specific abnormal conditions. More than one abnormal condition may be reported for a given birth or "None" may be selected. If the item is not completed it is tabulated as not stated. This item was included on the birth certificates of all States and the District of Columbia in 2002. However, four areas did not include all conditions. Nebraska and Texas did not report birth injury, New York City did not report assisted ventilation less than 30 minutes or assisted ventilation of 30 minutes or more, and Wisconsin did not report fetal alcohol syndrome.

Definitions adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics are available elsewhere (3).

Congenital anomalies of child

The data provided in this item relate to 21 specific anomalies or anomaly groups. It is well documented that congenital anomalies, except for the most visible and most severe, are incompletely reported on birth certificates (20). The completeness of reporting specific anomalies depends on how easily they are recognized in the short time between birth and birth-registration. Forty-nine States and the District of Columbia included this item on their birth certificates (New Mexico did not). This reporting area included 99 percent of all births in the United States in 2002. The format allows for the identification of more than one anomaly including a choice of "None" should no anomalies be evident. The "Not stated" category includes birth records for which the item is not completed.

In 2002 Oklahoma's rates for the "Other central nervous system anomalies" category may be overstated because of misreporting.

Definitions adapted and abbreviated from a set of definitions compiled by a committee of

Federal and State health statistics officials are available elsewhere (3).

Method of delivery

The birth certificate contains a checkbox for method of delivery. Choices include vaginal delivery, with the additional options of forceps, vacuum, and vaginal birth after previous cesarean section (VBAC), as well as a choice of primary or repeat cesarean. When only forceps, vacuum, or VBAC is checked, a vaginal birth is assumed. In 2002 this information was collected from the birth certificates of all States and the District of Columbia.

Several rates are computed for method of delivery. The overall cesarean section rate or total cesarean rate is computed as the proportion of all births that were delivered by cesarean section. The primary cesarean rate is a measure that relates the number of women having a primary cesarean birth to all women giving birth who have never had a cesarean delivery. The denominator for this rate is the sum of women with a vaginal birth excluding VBACs and women with a primary cesarean birth. The VBAC delivery rate is computed by relating all VBAC deliveries to the sum of VBAC and repeat cesarean deliveries, that is, to women with a previous cesarean section. VBAC rates are computed for first births because the rates are computed based on previous pregnancies, not just live births.

Hispanic parentage

The 1989 revision of the U.S. Standard Certificate of Live Births includes items to identify the Hispanic origin of the parents. All 50 States and the District of Columbia reported Hispanic origin of the parents for 2002.

In computing birth and fertility rates for the Hispanic population, births with origin of mother not stated are included with non-Hispanic births rather than being distributed. Thus, rates for the Hispanic population are underestimates of the true rates to the extent that the births with origin of mother not stated (0.6 percent in 2002) were actually to Hispanic mothers. The population with origin not stated was imputed. The effect on the rates is believed to be small.

Quality of Data

Although vital statistics data are useful for a variety of administrative and scientific purposes, they cannot be correctly interpreted unless various qualifying factors and methods of classification are taken into account. The factors to be considered depend on the specific purposes for which the data are to be used. It is not feasible to discuss all the pertinent factors in the use of vital statistics tabulations, but some of the more important ones should be mentioned.

Most of the factors limiting the use of data arise from imperfections in the original records or from the impracticability of tabulating these data in very detailed categories. These limitations should not be ignored, but their existence does not lessen the value of the data for most general purposes.

Completeness of registration

An estimated 99 percent of all births occurring in the United States in 2002 were registered; for white births registration was 99.5 percent complete and for all other births, 98.6 percent complete. These estimates are based on the results of the 1964–68 test of

birth-registration completeness according to place of delivery (in or out of hospital) and race. (This test has not been conducted more recently.) The primary purpose of the test was to obtain current measures of registration completeness for births in and out of hospital by race on a national basis. Data for States were not available as they had been from the previous birth-registration tests in 1940 and 1950. A detailed discussion of the method and results of the 1964–68 birth-registration test is available (21). Information on procedures for adjusting births for underregistration (for cohort fertility tables) is presented elsewhere (2).

Completeness of reporting

Interpretation of these data must include evaluation of item completeness. The "Not stated" percentage is one measure of the quality of the data. Completeness of reporting varies among items and States. See table A for the percentage of birth records on which specified items were not stated. Data users should note that levels of incomplete or inaccurate reporting for some of the items are quite high in some States. The 2002 data for Alaska, the District of Columbia, and Washington are of particular concern.

Quality control procedures

As electronic files are received at NCHS, they are automatically checked for completeness, individual item code validity, and unacceptable inconsistencies between data items. The registration area is notified of any problems. In addition, NCHS staff review the files on an ongoing basis to detect problems in overall quality such as inadequate reporting for certain items, failure to follow NCHS coding rules, and systems and software errors. Traditionally, quality assurance procedures were limited to review and analysis of differences between NCHS and registration area code assignments for a small sample of records. In recent years, as electronic birth registration became prevalent, this procedure was augmented by analyses of year-to-year and area-to-area variations in the data. These analyses are based on preliminary tabulations of the data that are cumulated by State on a year-to-date basis each month. NCHS investigates all differences that are judged to have consequences for quality and completeness. In the review process, statistical tests are used to call initial attention to differences for possible followup. As necessary, registration areas are informed of differences encountered in the tables and asked to verify the counts or to determine the nature of the differences. Missing records (except those permanently voided) and other problems detected by NCHS are resolved, and corrections are transmitted to NCHS in the same manner as for those corrections identified by the registration area.

Random variation and significance testing for natality data

A detailed discussion of random variation and significance testing for natality data is presented in the "Technical Notes" of "Births: Final data for 2002" (3). This section presents information specifically for Hispanic subgroups.

Computing confidence intervals for Hispanic subgroups

Birth and fertility rates for Mexicans, Puerto Ricans, Cubans, and "Other" Hispanics for 2002 are shown in tables 6, 8, 9, and 14 in "Births: Final data for 2002" (3) and in tables 1–4 and 1–12 of "Vital Statistics of the United States, Part 1, Natality." Population estimates for Hispanic subgroups are derived from the U.S. Census Bureau's *Current Population Survey* (CPS) and

adjusted to resident population control totals as shown in table 4–3. As a result, the rates are subject to the variability of the denominator as well as the numerator. For these Hispanic subgroups only (not for all origin, total Hispanic, total non-Hispanic, non-Hispanic white, or non-Hispanic black populations), the following formulas are used:

Approximate 95-percent confidence interval: 100 or more births

When the number of events in the numerator is greater than 100, the confidence interval for the birth rate can be estimated from the following formulas:

For crude and age–specific birth rates,

$$\text{Lower limit} = R - 1.96 * R * \sqrt{\left(\frac{1}{B}\right) + f\left(a + \frac{b}{P}\right)}$$

$$\text{Upper limit} = R + 1.96 * R * \sqrt{\left(\frac{1}{B}\right) + f\left(a + \frac{b}{P}\right)}$$

where:

R = rate (births per 1,000 population)
B = total number of births upon which rate is based
f = factor that depends on whether the population estimate is based on demographic analysis or CPS and the number of years used, equals 0.670 for single year
a and b are single year averages of the 2001 and 2002 CPS standard error parameters (22, 23)
a = -0.000200
b = 3,809
P = total estimated population upon which rate is based

Example

Suppose that the fertility rate of Cuban women 15–44 years of age was 51.2 per 1,000 based on 13,088 births in the numerator and an estimated resident population of 255,399 in the denominator. The 95-percent confidence interval would be:

$$\begin{aligned}
\text{Lower limit} &= 51.2 - 1.96 * 51.2 * \sqrt{\left(\frac{1}{13{,}088}\right) + 0.670 * \left[-0.000200 + \left(\frac{3{,}809}{255{,}399}\right)\right]} \\
&= 51.2 - 1.96 * 51.2 * \sqrt{0.000076406 + (0.670 * 0.0147139)} \\
&= 51.2 - 1.96 * 51.2 * \sqrt{0.0099347} \\
&= 51.2 - 1.96 * 51.2 * 0.099673 \\
&= 41.20
\end{aligned}$$

$$\text{Upper limit} = 51.2 + 1.96 * 51.2 * \sqrt{\left(\frac{1}{13,088}\right) + 0.670 * \left[-0.000200 + \left(\frac{3,809}{255,399}\right)\right]}$$

$$= 51.2 + 1.96 * 51.2 * \sqrt{0.000076406 + (0.670 * 0.0147139)}$$

$$= 51.2 + 1.96 * 51.2 * \sqrt{0.0099347}$$

$$= 51.2 + 1.96 * 51.2 * 0.1099673$$

$$= 61.20$$

This means that the chances are 95 out of 100 that the actual fertility rate of Cuban women 15–44 years of age is between 41.20 and 61.20.

Approximate 95-percent confidence interval: 1–99 births

When the number of events in the numerator is less than 20, an asterisk is shown in place of the rate. When the number of events in the numerator is greater than 20 but less than 100, the confidence interval for the birth rate can be estimated using the formulas that follow and the values in table C.

For crude and age–specific birth rates,

$$\text{Lower limit} = R * L(1-\alpha = .96, B) * \left(1 - 2.576\sqrt{f\left(a + \frac{b}{P}\right)}\right)$$

$$\text{Upper limit} = R * U(1-\alpha = .96, B) * \left(1 + 2.576\sqrt{f\left(a + \frac{b}{P}\right)}\right)$$

where:

R = rate (births per 1,000 population)
B = total number of births upon which rate is based
L = the value in table C that corresponds to the number B, using the 96 percent CI column
U = the value in table C that corresponds to the number B, using the 96 percent CI column
f = factor that depends on whether the population estimate is based on demographic analysis or CPS and the number of years used, equals 0.670 for single year
a and b are CPS standard error parameters (see previous section on 95-percent confidence interval for 100 or more births for description and specific values)
P = total estimated population upon which rate is based

Example

Suppose that the birth rate of Puerto Rican women 45–49 years of age was 0.4 per 1,000, based on 35 births in the numerator and an estimated resident population of 87,892 in the denominator. Using table C, the 95-percent confidence interval would be:

$$\text{Lower limit} = 0.4 * 0.68419 * \left(1 - 2.576\sqrt{0.670\left(-0.000200 + \left(\frac{3{,}809}{87{,}892}\right)\right)}\right)$$
$$= 0.4 * 0.68419 * \left(1 - 2.576\sqrt{0.289020}\right)$$
$$= 0.4 * 0.68419 * \left(1 - 2.576 * 0.170006\right)$$
$$= 0.4 * 0.68419 * 0.562065$$
$$= 0.2$$

$$\text{Upper limit} = 0.4 * 1.41047 * \left(1 + 2.576\sqrt{0.670\left(-0.000200 + \left(\frac{3{,}809}{87{,}892}\right)\right)}\right)$$
$$= 0.4 * 1.41047 * \left(1 + 2.576\sqrt{0.289020}\right)$$
$$= 0.4 * 1.41047 * \left(1 + 2.576 * 0.170006\right)$$
$$= 0.4 * 1.41047 * 1.437935$$
$$= 0.8$$

This means that the chances are 95 out of 100 that the actual birth rate of Puerto Rican women 45–49 years of age lies between 0.2 and 0.8.

NOTE: In the formulas above, the confidence limits are estimated from the nonsampling error in the number of births, the numerator, and the sampling error in the population estimate, the denominator. A 96 percent standard error is computed for the numerator and a 99 percent standard error is computed for the denominator in order to compute a 95-percent confidence interval for the rate.

Significance testing for Hispanic subgroups

When both rates are based on 100 or more events, the difference between the two rates is considered statistically significant if it exceeds the statistic in the formula below. This statistic equals 1.96 times the standard error for the difference between two rates.

$$= 1.96 * \sqrt{R_1^2 * \left[\left(\frac{1}{B_1}\right) + f\left(a + \frac{b}{P_1}\right)\right] + R_2^2 * \left[\left(\frac{1}{B_2}\right) + f\left(a + \frac{b}{P_2}\right)\right]}$$

If the difference is greater than this statistic, then the difference would occur by chance less than 5 times out of 100. If the difference is less than this statistic, the difference might occur by chance more than 5 times out of 100. We would therefore conclude that the difference is not statistically significant at the 95-percent Confidence level.

Example

Suppose the birth rate for Mexican mothers 15–19 years of age (R_1) is 94.5, based on 97,744 births and an estimated population of 1,033,878, and the birth rate for Puerto Rican mothers 15–19 years of age (R_2) is 61.4, based on 10,006 births and an estimated population of 162,899.

Using the above formula, the z score is computed as follows:

$$= 1.96 * \sqrt{94.5^2 * \left[\left(\frac{1}{97{,}744}\right) + 0.670\left(-0.0002000 + \frac{3{,}809}{1{,}033{,}878}\right)\right] + 61.4^2 * \left[\left(\frac{1}{10{,}006}\right) + 0.670\left(-0.000200 + \frac{3{,}809}{162{,}899}\right)\right]}$$

$$= 1.96 * \sqrt{8930.25 * (0.000010231 + 0.670 * 0.003484) + 3769.96 * (0.00009994 + 0.670 * 0.023183)}$$

$$= 1.96 * \sqrt{(8930.25 * 0.0023445) + (3769.96 * 0.0156326)}$$

$$= 1.96 * \sqrt{20.94 + 58.93}$$

$$= 1.96 * 8.94$$

$$= 17.52$$

Since the difference between the two rates of 33.1 is greater than the value above, the two rates are statistically significantly different at the 0.05 level of significance.

Computation of Rates and Other Measures

Population bases

The rates shown in this report were computed based on population statistics prepared by the U.S. Census Bureau. Rates for 1940, 1950, 1960, 1970, 1980, 1990, and 2000 are based on the population enumerated as of April 1 in the censuses of those years. Rates for all other years are based on the estimated midyear (July 1) population for the respective years. These populations have been modified to be consistent with Office of Management and Budget (OMB) racial categories and historical categories for birth data and, in the case of age, to reflect age as of the census reference date (24).

An asterisk (*) is shown in place of any derived rate based on fewer than 20 births in the numerator, or a population denominator of less than 50 (unweighted) for decennial years and 75,000 (weighted) for all other years for the Hispanic subgroups. Rates based on populations below these minimum levels lack sufficient reliability for analytic purposes.

Populations in tables 4–1 through 4–4 differ from those used to calculate birth and fertility rates published in "Births: Final data for 2001" and "Births: Final data for 2000" (3,25). Rates in these publications were based on postcensal population estimates based on the 1990 census. Populations for April 1, 2000, and July 1, 2001, provided in this report were produced under a collaborative arrangement with the U.S. Census Bureau (26–28) and are based on the 2000 census counts by age, race, and sex, which were modified to be consistent with OMB racial categories of 1977 and historical categories for birth data and, in the case of age, to reflect age as of the census reference date. The modification procedures are described in detail elsewhere (24, 29–30).

Reflecting the new guidelines issued in 1997 by the OMB, the 2000 census included an option for individuals to report more than one race as appropriate for themselves and household members (31). The 1997 OMB guidelines also provided for the reporting of Asian persons separately from Native Hawaiians or other Pacific Islanders. Under the prior OMB standards (issued in 1977), data for Asian or Pacific Islander persons were collected as a single group (32). Birth certificates currently collect only one race for the mother and father in the same categories as specified in the 1977 guidelines, (that is, the certificates do not report Asians separately from

Native Hawaiians or other Pacific Islanders). Birth data by race (the numerators for birth rates) are thus currently incompatible with the population data collected in the 2000 census (denominators by race).

To produce birth rates for 2000–2002 and revised intercensal rates for 1991–99, it was necessary to bridge the reported population data for multiple-race persons back to single-race categories. In addition, the 2000 census counts were modified to be consistent with the 1977 OMB race categories, that is, to report the data for Asian persons and Native Hawaiians or Other Pacific Islanders as a combined category, Asian or Pacific Islanders (24). The procedures used to produce the bridged populations are described elsewhere (29,30).

It is anticipated that bridged population data will be used over the next few years for computing population-based rates. Beginning with births occurring in 2003, several States began reporting multiple race data. Once all State birth certificates are revised to be compliant with the 1997 OMB standard, the use of bridged populations can be discontinued.

The special report "Revised Birth and Fertility Rates for the United States, 2000 and 2001" (33) updates the rates published in "Births: Final data for 2001" and "Births: Final data for 2000" (3,25). The revised birth and fertility rates in the special report include rates by race and Hispanic origin, by age of mother, and by age of father for 2000 and 2001. Rates for unmarried women are also presented. A subsequent special report shows revised birth and fertility rates, including rates by marital status for the United States, and rates by age of mother by State, for the intercensal years, 1991–99, along with the rates for 2000 and 2001 (34). Additional information on the revised populations is available at:
http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm

Birth rates for the United States, individual States, and metropolitan areas are based on the total resident populations of the respective areas (table 4–4). Except as noted these populations exclude the Armed Forces abroad but include the Armed Forces stationed in each area. The resident population of the birth- and death-registration States for 1900–32 and for the United States for 1900–2002 is shown in table 4–1. In addition, the population including Armed Forces abroad is shown for the United States. Table D shows the sources for these populations. A detailed discussion of historical population bases is presented elsewhere (2).

Net census undercounts and overcounts

Studies conducted by the U.S. Census Bureau indicate that some age, race, and sex groups are more completely enumerated than others. These census miscounts can have consequences for vital statistics measures. For example, an adjustment to increase the population denominator would result in a smaller rate compared to the unadjusted rate. A more detailed discussion of census undercounts and overcounts can be found in the "1999 Technical Appendix" (2). Adjusted rates for 2000 can be computed by multiplying the reported rates by ratios of the 2000 census-level population adjusted for the estimated net census miscounts, which are shown in table E.

Cohort fertility tables

The various fertility measures shown for cohorts of women are computed from births adjusted for underregistration and population estimates corrected for under enumeration and misstatement of age. Data published after 1974 use revised population estimates prepared by the U.S. Census Bureau and have been expanded to include data for the two major racial groups. Heuser has prepared a detailed description of the methods used in deriving these measures as

well as more detailed data for earlier years (35). Tables for the most currently-available years are available at http://www.cdc.gov/nchs/datawh/statab/unpubd/natality/natab99.htm.

Parity distribution—The percentage distribution of women by parity (number of children ever born alive to mother) is derived from cumulative birth rates by order of birth. The percentage of 0-parity women is found by subtracting the cumulative first birth rate from 1,000 and dividing by 10. The proportions of women at parities one through six are found from the following formula:

$$\text{Percent at N parity} = ((\text{cum. rate, order N})-(\text{cum. rate, order N} + 1))/10$$

The percentage of women at seventh and higher parities is found by dividing the cumulative rate for seventh-order births by 10.

Birth probabilities—Birth probabilities indicate the likelihood that a woman of a certain parity and age at the beginning of the year will have a child during the year. Birth probabilities differ from central birth rates in that the denominator for birth probabilities is specific for parity as well as for age.

Total fertility rate

The total fertility rate is the sum of the birth rates by age of mother (in 5–year age groups) multiplied by 5. It is an age–adjusted rate because it is based on the assumption that there are the same number of women in each age group. The rate of 2,013 in 2002, for example, means that if a hypothetical group of 1,000 women were to have the same birth rates in each age group that were observed in the actual childbearing population in 2002, they would have a total of 2,013 children by the time they reached the end of the reproductive period (taken here to be age 50 years), assuming that all of the women survived to that age.

Seasonal adjustment of rates

The seasonally adjusted birth and fertility rates are computed from the X–11 variant of Census Method II (36). This method, used since 1964, differs slightly from the U.S. Bureau of Labor Statistics (BLS) Seasonal Factor Method, which was used for *Vital Statistics of the United States*, 1964. The fundamental technique is the same in that it is an adaptation of the ratio-to-moving-average method. Before 1964, the method of seasonal adjustment was based on the X–9 variant and other variants of Census Method II. A comparison of the Census Method II with the BLS Seasonal Factor Method shows the differences in the seasonal patterns of births to be negligible.

Computations of percentages, percentage distributions, and medians

Births for which a particular characteristic is unknown were subtracted from the figures for total births that were used as denominators before percentages, percentage distributions, and medians were computed. The percentage of records with missing information for each item is shown by State in table A. The median number of prenatal visits also excludes births to mothers who had no prenatal care. Computations of the median years of school completed and the median number of prenatal visits were based on ungrouped data. The median age of mother is computed from birth rates in 5–year age groups, which eliminates the effects of changes in the age composition of the childbearing population over time. An asterisk is shown in place of any derived statistic based on fewer than 20 births in the numerator or denominator.

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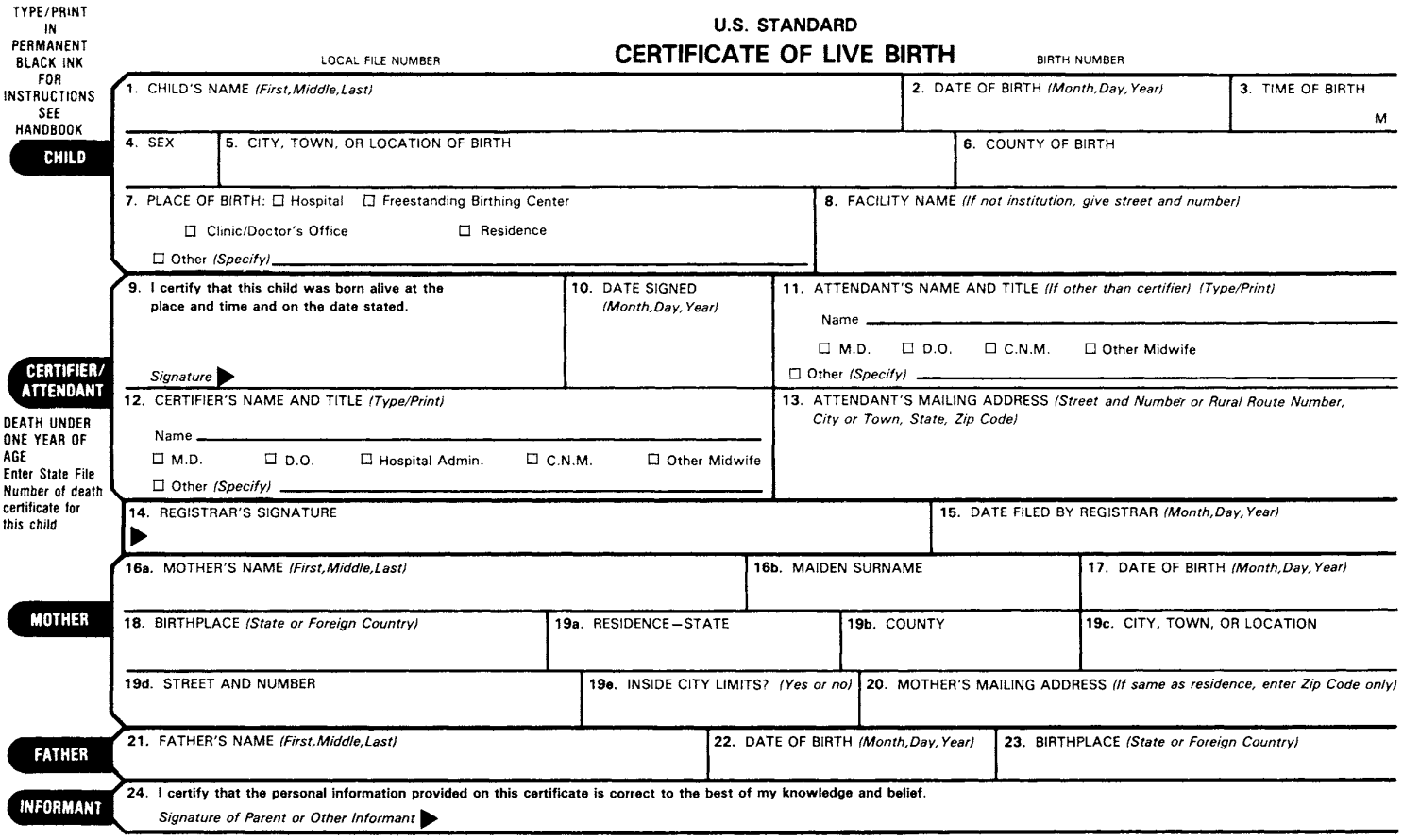
Figure 4–A. U.S. Standard Certificate of Live Birth: 1989 Revision



TYPE/PRINT IN PERMANENT BLACK INK FOR INSTRUCTIONS SEE HANDBOOK

U.S. STANDARD

CERTIFICATE OF LIVE BIRTH

LOCAL FILE NUMBER

BIRTH NUMBER

CHILD

1. CHILD'S NAME *(First, Middle, Last)*
2. DATE OF BIRTH *(Month, Day, Year)*
3. TIME OF BIRTH M
4. SEX
5. CITY, TOWN, OR LOCATION OF BIRTH
6. COUNTY OF BIRTH
7. PLACE OF BIRTH: ☐ Hospital ☐ Freestanding Birthing Center ☐ Clinic/Doctor's Office ☐ Residence ☐ Other *(Specify)*
8. FACILITY NAME *(If not institution, give street and number)*

CERTIFIER/ ATTENDANT

9. **I certify that this child was born alive at the place and time and on the date stated.** *Signature* ▶
10. DATE SIGNED *(Month, Day, Year)*
11. ATTENDANT'S NAME AND TITLE *(If other than certifier) (Type/Print)* Name ☐ M.D. ☐ D.O. ☐ C.N.M. ☐ Other Midwife ☐ Other *(Specify)*
12. CERTIFIER'S NAME AND TITLE *(Type/Print)* Name ☐ M.D. ☐ D.O. ☐ Hospital Admin. ☐ C.N.M. ☐ Other Midwife ☐ Other *(Specify)*
13. ATTENDANT'S MAILING ADDRESS *(Street and Number or Rural Route Number, City or Town, State, Zip Code)*

DEATH UNDER ONE YEAR OF AGE Enter State File Number of death certificate for this child

14. REGISTRAR'S SIGNATURE ▶
15. DATE FILED BY REGISTRAR *(Month, Day, Year)*

MOTHER

16a. MOTHER'S NAME *(First, Middle, Last)*
16b. MAIDEN SURNAME
17. DATE OF BIRTH *(Month, Day, Year)*
18. BIRTHPLACE *(State or Foreign Country)*
19a. RESIDENCE—STATE
19b. COUNTY
19c. CITY, TOWN, OR LOCATION
19d. STREET AND NUMBER
19e. INSIDE CITY LIMITS? *(Yes or no)*
20. MOTHER'S MAILING ADDRESS *(If same as residence, enter Zip Code only)*

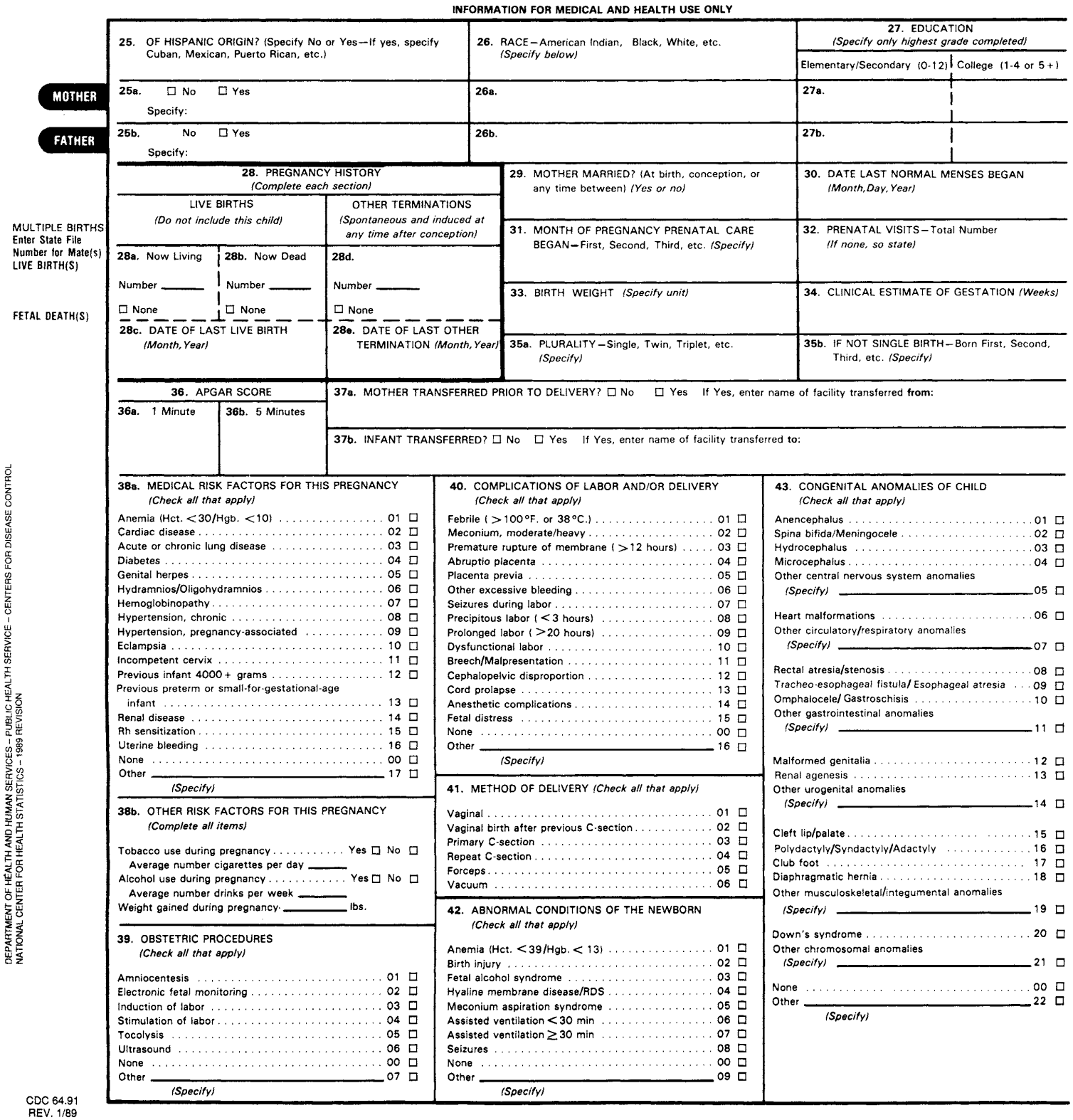
FATHER

21. FATHER'S NAME *(First, Middle, Last)*
22. DATE OF BIRTH *(Month, Day, Year)*
23. BIRTHPLACE *(State or Foreign Country)*

INFORMANT

24. **I certify that the personal information provided on this certificate is correct to the best of my knowledge and belief.** *Signature of Parent or Other Informant* ▶

Figure 4–A. U.S. Standard Certificate of Live Birth: 1989 Revision - Con.



INFORMATION FOR MEDICAL AND HEALTH USE ONLY

	25. OF HISPANIC ORIGIN? (Specify No or Yes—If yes, specify Cuban, Mexican, Puerto Rican, etc.)	26. RACE—American Indian, Black, White, etc. *(Specify below)*	27. EDUCATION *(Specify only highest grade completed)*
			Elementary/Secondary (0-12) | College (1-4 or 5+)
MOTHER	25a. ☐ No ☐ Yes Specify:	26a.	27a.
FATHER	25b. No ☐ Yes Specify:	26b.	27b.

28. PREGNANCY HISTORY *(Complete each section)*			29. MOTHER MARRIED? (At birth, conception, or any time between) *(Yes or no)*	30. DATE LAST NORMAL MENSES BEGAN *(Month, Day, Year)*
	LIVE BIRTHS *(Do not include this child)*	OTHER TERMINATIONS *(Spontaneous and induced at any time after conception)*		
MULTIPLE BIRTHS Enter State File Number for Mate(s) LIVE BIRTH(S)	28a. Now Living Number ____ ☐ None	28b. Now Dead Number ____ ☐ None	28d. Number ____ ☐ None	31. MONTH OF PREGNANCY PRENATAL CARE BEGAN—First, Second, Third, etc. *(Specify)*	32. PRENATAL VISITS—Total Number *(If none, so state)*
FETAL DEATH(S)				33. BIRTH WEIGHT *(Specify unit)*	34. CLINICAL ESTIMATE OF GESTATION *(Weeks)*
	28c. DATE OF LAST LIVE BIRTH *(Month, Year)*	28e. DATE OF LAST OTHER TERMINATION *(Month, Year)*		35a. PLURALITY—Single, Twin, Triplet, etc. *(Specify)*	35b. IF NOT SINGLE BIRTH—Born First, Second, Third, etc. *(Specify)*

36. APGAR SCORE		37a. MOTHER TRANSFERRED PRIOR TO DELIVERY? ☐ No ☐ Yes If Yes, enter name of facility transferred **from:**
36a. 1 Minute	36b. 5 Minutes	37b. INFANT TRANSFERRED? ☐ No ☐ Yes If Yes, enter name of facility transferred **to:**

38a. MEDICAL RISK FACTORS FOR THIS PREGNANCY *(Check all that apply)*

Anemia (Hct. <30/Hgb. <10)	01	☐
Cardiac disease	02	☐
Acute or chronic lung disease	03	☐
Diabetes	04	☐
Genital herpes	05	☐
Hydramnios/Oligohydramnios	06	☐
Hemoglobinopathy	07	☐
Hypertension, chronic	08	☐
Hypertension, pregnancy-associated	09	☐
Eclampsia	10	☐
Incompetent cervix	11	☐
Previous infant 4000+ grams	12	☐
Previous preterm or small-for-gestational-age infant	13	☐
Renal disease	14	☐
Rh sensitization	15	☐
Uterine bleeding	16	☐
None	00	☐
Other ____ *(Specify)*	17	☐

38b. OTHER RISK FACTORS FOR THIS PREGNANCY *(Complete all items)*

Tobacco use during pregnancy ..... Yes ☐ No ☐
Average number cigarettes per day ____
Alcohol use during pregnancy ..... Yes ☐ No ☐
Average number drinks per week ____
Weight gained during pregnancy ____ lbs.

39. OBSTETRIC PROCEDURES *(Check all that apply)*

Amniocentesis	01	☐
Electronic fetal monitoring	02	☐
Induction of labor	03	☐
Stimulation of labor	04	☐
Tocolysis	05	☐
Ultrasound	06	☐
None	00	☐
Other ____ *(Specify)*	07	☐

40. COMPLICATIONS OF LABOR AND/OR DELIVERY *(Check all that apply)*

Febrile (>100°F. or 38°C.)	01	☐
Meconium, moderate/heavy	02	☐
Premature rupture of membrane (>12 hours)	03	☐
Abruptio placenta	04	☐
Placenta previa	05	☐
Other excessive bleeding	06	☐
Seizures during labor	07	☐
Precipitous labor (<3 hours)	08	☐
Prolonged labor (>20 hours)	09	☐
Dysfunctional labor	10	☐
Breech/Malpresentation	11	☐
Cephalopelvic disproportion	12	☐
Cord prolapse	13	☐
Anesthetic complications	14	☐
Fetal distress	15	☐
None	00	☐
Other ____ *(Specify)*	16	☐

41. METHOD OF DELIVERY *(Check all that apply)*

Vaginal	01	☐
Vaginal birth after previous C-section	02	☐
Primary C-section	03	☐
Repeat C-section	04	☐
Forceps	05	☐
Vacuum	06	☐

42. ABNORMAL CONDITIONS OF THE NEWBORN *(Check all that apply)*

Anemia (Hct. <39/Hgb. <13)	01	☐
Birth injury	02	☐
Fetal alcohol syndrome	03	☐
Hyaline membrane disease/RDS	04	☐
Meconium aspiration syndrome	05	☐
Assisted ventilation <30 min	06	☐
Assisted ventilation ≥30 min	07	☐
Seizures	08	☐
None	00	☐
Other ____ *(Specify)*	09	☐

43. CONGENITAL ANOMALIES OF CHILD *(Check all that apply)*

Anencephalus	01	☐
Spina bifida/Meningocele	02	☐
Hydrocephalus	03	☐
Microcephalus	04	☐
Other central nervous system anomalies *(Specify)* ____	05	☐
Heart malformations	06	☐
Other circulatory/respiratory anomalies *(Specify)* ____	07	☐
Rectal atresia/stenosis	08	☐
Tracheo-esophageal fistula/ Esophageal atresia	09	☐
Omphalocele/ Gastroschisis	10	☐
Other gastrointestinal anomalies *(Specify)* ____	11	☐
Malformed genitalia	12	☐
Renal agenesis	13	☐
Other urogenital anomalies *(Specify)* ____	14	☐
Cleft lip/palate	15	☐
Polydactyly/Syndactyly/Adactyly	16	☐
Club foot	17	☐
Diaphragmatic hernia	18	☐
Other musculoskeletal/integumental anomalies *(Specify)* ____	19	☐
Down's syndrome	20	☐
Other chromosomal anomalies *(Specify)* ____	21	☐
None	00	☐
Other ____ *(Specify)*	22	☐

DEPARTMENT OF HEALTH AND HUMAN SERVICES – PUBLIC HEALTH SERVICE – CENTERS FOR DISEASE CONTROL
NATIONAL CENTER FOR HEALTH STATISTICS – 1989 REVISION

CDC 64.91
REV. 1/89

Table A. Percentage of birth records on which specified items were not stated: United States and each State and territory, 2002

[By place of residence]

Area	All births	Place of birth	Attendant at birth	Mother's birthplace	Father's age	Father's race	Hispanic origin	
							Mother	Father
Total of reporting areas[1]	4,021,726	0.0	0.0	0.2	13.4	14.2	0.6	14.1
Alabama	58,967	-	0.0	0.1	21.3	21.5	0.1	21.3
Alaska	9,938	0.2	0.0	0.7	14.3	16.3	22.5	22.9
Arizona	87,837	0.0	0.0	0.1	21.1	22.5	1.1	22.1
Arkansas	37,437	0.0	0.0	0.6	19.7	21.6	0.5	20.6
California	529,357	0.0	0.0	0.2	7.1	7.0	0.8	6.6
Colorado	68,418	-	-	0.4	8.1	8.7	0.0	8.7
Connecticut	42,001	0.0	0.1	0.4	9.8	11.3	0.8	10.7
Delaware	11,090	-	0.0	0.2	31.4	32.7	0.1	31.3
District of Columbia	7,498	-	-	0.1	39.4	48.8	0.7	39.2
Florida	205,579	0.0	0.0	0.1	16.1	16.5	0.2	18.2
Georgia	133,300	0.0	0.0	0.2	17.2	17.5	1.3	18.3
Hawaii	17,477	-	0.1	0.2	10.0	10.1	0.2	10.1
Idaho	20,970	0.0	0.0	0.5	7.9	11.8	1.6	12.1
Illinois	180,622	0.0	-	0.1	13.1	14.7	0.0	14.6
Indiana	85,081	0.0	0.1	0.1	12.9	12.9	0.4	13.1
Iowa	37,559	0.0	0.0	0.0	13.6	14.3	0.2	13.9
Kansas	39,412	-	0.0	0.1	10.2	10.7	1.0	11.6
Kentucky	54,233	-	0.1	0.0	19.4	22.2	0.1	22.3
Louisiana	64,872	0.0	0.0	0.0	20.0	20.1	0.1	20.0
Maine	13,559	-	0.0	-	9.1	13.2	0.3	13.5
Maryland	73,323	-	0.0	0.4	12.0	13.9	0.4	11.7
Massachusetts	80,645	0.0	0.0	0.0	7.2	7.2	0.6	6.6
Michigan	129,967	0.0	0.1	0.1	14.1	16.5	1.6	17.3
Minnesota	68,025	0.0	0.0	0.2	8.9	13.4	1.3	14.0
Mississippi	41,518	0.0	0.0	0.1	21.4	21.2	0.1	21.4
Missouri	75,251	-	0.0	0.2	18.8	18.9	0.1	18.0
Montana	11,049	-	0.1	0.0	9.5	11.0	1.8	12.6
Nebraska	25,383	0.0	0.0	0.0	12.0	13.9	2.3	14.2
Nevada	32,571	-	0.0	0.4	21.5	22.6	0.7	21.6
New Hampshire	14,442	-	0.0	0.1	5.4	7.4	3.8	10.6
New Jersey	114,751	0.0	0.0	0.1	7.6	9.1	0.1	7.8
New Mexico	27,753	0.0	-	1.3	20.6	20.1	0.0	20.1
New York	251,415	0.0	0.0	0.3	13.3	13.9	0.4	13.5
North Carolina	117,335	-	0.0	0.0	15.6	15.7	0.1	15.8
North Dakota	7,757	-	-	0.0	8.5	9.0	1.6	10.6
Ohio	148,720	0.0	0.0	0.4	15.0	15.6	0.2	15.1
Oklahoma	50,387	-	0.0	0.0	17.5	20.0	0.0	19.8
Oregon	45,192	-	0.0	0.1	9.9	4.1	0.6	4.5
Pennsylvania	142,850	0.0	0.1	1.0	5.1	5.9	0.8	4.6
Rhode Island	12,894	0.0	0.0	0.4	12.9	13.5	11.7	22.2
South Carolina	54,570	0.0	0.0	0.1	26.9	27.0	0.2	26.9
South Dakota	10,698	-	-	0.0	13.8	14.0	0.1	14.2
Tennessee	77,482	-	0.0	0.1	15.3	15.7	0.0	15.5
Texas	372,450	0.0	0.0	0.4	14.1	14.4	0.4	14.5
Utah	49,182	0.0	0.0	0.2	7.8	9.3	0.4	8.9
Vermont	6,387	0.0	-	0.2	8.3	12.8	1.2	13.7
Virginia	99,672	-	0.0	0.1	16.2	18.7	0.2	16.4
Washington	79,028	-	0.1	0.4	10.1	13.2	1.8	13.4
West Virginia	20,712	0.0	0.0	0.1	13.0	13.2	0.2	13.2
Wisconsin	68,560	0.0	-	0.1	29.6	29.7	0.0	29.6
Wyoming	6,550	-	-	0.2	13.8	14.0	0.0	13.9
Puerto Rico	52,747	-	0.0	-	3.1	4.0	---	---
Virgin Islands	1,634	-	0.6	0.1	18.7	20.6	4.3	26.2
Guam	3,212	0.1	0.9	0.6	22.0	22.3	2.8	29.0
American Samoa	1,627	0.2	0.3	5.7	32.0	32.9	---	---
Northern Marianas	1,290	-	-	-	8.1	7.1	---	---

See footnotes at end of table.

Table A. Percentage of birth records on which specified items were not stated: United States and each State and territory, 2002— Con.

[By place of residence]

Area	Educational attainment of mother	Live-birth order	Length of gestation	Month prenatal care began	Number of prenatal visits
Total of reporting areas[1]	1.3	0.3	1.0	2.0	2.7
Alabama	0.2	0.0	0.1	0.3	0.3
Alaska	4.8	5.8	0.5	5.3	8.2
Arizona	2.0	0.4	0.1	1.1	1.9
Arkansas	0.9	0.1	0.2	1.5	1.8
California	2.2	0.1	[2]6.6	1.9	3.0
Colorado	0.8	0.0	0.0	1.5	2.0
Connecticut	0.8	0.1	0.1	1.2	2.4
Delaware	0.7	0.1	0.1	0.4	0.5
District of Columbia	8.8	1.5	0.2	12.0	7.1
Florida	0.8	0.0	0.1	1.2	2.3
Georgia	1.5	0.2	0.1	1.7	2.0
Hawaii	1.0	0.1	0.3	2.2	2.1
Idaho	3.2	0.2	0.2	2.9	2.4
Illinois	1.1	0.2	0.2	2.5	3.0
Indiana	0.5	0.1	0.1	1.0	1.9
Iowa	0.2	0.0	0.1	0.2	0.3
Kansas	0.3	0.0	0.1	0.8	1.1
Kentucky	0.3	0.1	0.2	1.2	1.6
Louisiana	0.1	0.0	0.1	0.2	0.1
Maine	0.5	0.1	0.1	0.2	0.2
Maryland	1.5	0.3	0.2	1.7	2.5
Massachusetts	0.3	0.2	0.2	1.4	0.5
Michigan	2.1	0.4	0.1	2.0	2.7
Minnesota	1.7	0.5	0.3	3.7	5.0
Mississippi	0.3	0.1	0.2	0.9	1.7
Missouri	0.8	0.6	0.2	2.0	4.0
Montana	0.4	0.0	0.1	0.5	0.6
Nebraska	0.1	0.0	0.0	0.3	0.3
Nevada	2.8	0.8	0.9	4.2	6.8
New Hampshire	1.3	0.1	0.2	1.7	1.3
New Jersey	1.2	0.2	0.0	1.3	1.5
New Mexico	2.6	0.4	0.3	4.3	4.9
New York	0.9	0.3	0.1	3.4	2.1
North Carolina	0.2	0.0	0.0	0.7	0.6
North Dakota	0.4	0.0	0.1	0.8	0.8
Ohio	0.9	0.8	0.0	1.4	2.8
Oklahoma	0.3	0.0	0.1	1.0	0.5
Oregon	1.4	0.0	0.0	0.1	0.2
Pennsylvania	2.8	0.6	0.5	6.3	7.0
Rhode Island	2.4	1.4	0.1	4.1	4.6
South Carolina	0.4	0.1	0.1	0.8	0.9
South Dakota	0.1	0.0	0.0	0.2	0.2
Tennessee	0.3	0.0	0.3	2.1	2.2
Texas	1.5	0.3	0.4	1.4	3.6
Utah	1.3	0.3	0.0	2.4	2.3
Vermont	0.8	0.2	0.1	4.1	0.9
Virginia	1.3	0.0	0.0	0.2	1.2
Washington	5.5	1.4	0.9	8.8	11.5
West Virginia	0.7	0.0	0.1	2.9	1.7
Wisconsin	0.4	0.0	0.0	0.2	0.3
Wyoming	0.3	0.0	0.1	0.5	0.6
Puerto Rico	0.2	0.0	0.0	0.3	0.1
Virgin Islands	1.4	0.8	0.8	-	1.6
Guam	1.3	1.4	0.2	1.4	1.7
American Samoa	---	-	---	---	---
Northern Marianas	0.5	-	0.8	1.6	1.3

See footnotes at end of table.

Table A. Percentage of birth records on which specified items were not stated: United States and each State and territory, 2002—Con.

[By place of residence]

Area	Birthweight	5-minute apgar score	Medical risk factors	Tobacco use	Alcohol use	Weight gain
Total of reporting areas[1]	0.1	0.4	0.7	0.5	0.7	6.3
Alabama	0.1	0.2	0.0	0.1	0.1	2.7
Alaska	0.3	0.5	3.2	1.0	1.1	7.7
Arizona	0.1	0.5	0.0	1.0	1.2	15.8
Arkansas	0.0	3.3	0.0	0.8	0.9	9.3
California	0.0	---	0.0	---	---	---
Colorado	0.0	0.3	0.0	0.1	0.1	2.6
Connecticut	0.0	0.2	1.0	0.4	0.4	2.8
Delaware	0.0	0.1	0.0	0.1	0.1	1.2
District of Columbia	0.1	0.5	-	-	-	12.3
Florida	0.0	0.2	0.0	0.1	0.1	5.4
Georgia	0.0	0.4	0.4	0.3	0.3	9.6
Hawaii	0.1	0.4	0.1	0.1	0.1	13.6
Idaho	0.1	0.5	0.3	0.4	0.6	8.6
Illinois	0.1	0.2	0.0	0.2	0.1	4.3
Indiana	0.4	0.3	0.0	[3] 0.2	0.2	2.4
Iowa	0.0	0.3	0.0	0.1	0.1	0.5
Kansas	0.0	0.7	[4] 0.1	0.1	0.1	0.2
Kentucky	0.2	0.3	2.3	1.7	2.3	6.9
Louisiana	0.1	0.3	0.1	0.1	0.1	5.1
Maine	0.1	0.1	0.1	0.1	0.2	0.7
Maryland	0.0	0.3	0.0	0.1	0.1	3.4
Massachusetts	0.2	0.3	0.2	0.2	0.2	0.8
Michigan	0.1	0.3	0.0	0.9	1.0	6.8
Minnesota	0.1	0.3	7.0	5.5	5.6	16.3
Mississippi	0.1	0.3	0.2	0.2	0.2	5.9
Missouri	0.1	0.6	0.1	0.5	0.5	3.5
Montana	0.1	0.4	0.0	0.7	1.0	1.3
Nebraska	0.0	0.2	0.0	0.1	0.1	1.4
Nevada	0.0	1.5	2.0	1.7	1.7	7.4
New Hampshire	0.1	0.3	0.0	0.3	0.3	3.9
New Jersey	0.1	0.2	0.4	0.3	0.4	2.1
New Mexico	0.2	3.4	0.0	1.1	1.1	7.2
New York	0.1	0.2	2.3	[3] 0.2	0.2	5.1
North Carolina	0.1	0.3	0.0	0.2	0.2	2.5
North Dakota	0.1	0.2	0.2	1.3	1.8	3.2
Ohio	0.1	0.2	0.0	0.3	0.3	3.2
Oklahoma	0.0	1.0	1.2	0.2	0.2	1.5
Oregon	0.0	0.4	0.8	1.1	1.1	2.4
Pennsylvania	0.0	0.4	0.1	1.0	1.0	13.5
Rhode Island	0.2	0.3	9.0	2.0	2.0	14.3
South Carolina	0.0	0.2	0.0	0.1	0.1	1.7
South Dakota	0.0	0.3	0.0	[5] 0.1	[5] 0.2	0.6
Tennessee	0.0	0.3	0.0	0.2	0.2	8.3
Texas	0.1	---	[6] 0.6	0.3	0.3	9.0
Utah	0.1	0.3	0.1	0.6	0.7	3.5
Vermont	0.2	0.3	0.1	0.5	0.3	1.1
Virginia	0.1	0.1	0.0	0.0	0.0	3.4
Washington	0.5	0.7	11.1	2.7	9.2	26.8
West Virginia	0.1	0.3	0.7	0.5	1.0	8.1
Wisconsin	0.0	0.4	0.1	0.1	0.1	2.2
Wyoming	0.0	0.2	0.0	0.1	0.2	1.5
Puerto Rico	0.0	0.1	0.0	0.0	0.0	0.1
Virgin Islands	0.3	2.6	5.3	0.6	0.6	20.4
Guam	0.2	0.7	1.4	0.4	0.6	3.7
American Samoa	-	---	---	---	---	---
Northern Marianas	0.4	1.4	---	[5] 0.9	[5] 1.0	---

See footnotes at end of table.

Table A. Percentage of birth records on which specified items were not stated: United States and each State and territory, 2002— Con.

[By place of residence]

Area	Obstetric procedures	Complications of labor and/or delivery	Method or delivery	Abnormal conditions of newborn	Congenital anomalies
Total of reporting areas[1]	0.4	0.5	0.5	0.7	0.7
Alabama	0.0	0.0	0.5	0.0	0.0
Alaska	3.1	3.0	0.2	3.7	4.2
Arizona	0.0	0.0	0.4	0.0	0.3
Arkansas	0.0	0.0	0.4	0.0	0.0
California	0.0	0.0	0.0	0.0	0.0
Colorado	0.0	0.0	0.0	0.0	0.2
Connecticut	0.5	0.6	0.5	2.2	2.6
Delaware	0.1	0.0	0.0	0.1	0.0
District of Columbia	-	-	0.1	-	-
Florida	0.0	0.0	0.6	0.0	0.0
Georgia	0.0	0.0	0.5	0.0	0.0
Hawaii	0.0	0.1	0.6	0.1	0.0
Idaho	0.3	0.4	0.4	0.4	0.4
Illinois	0.0	0.0	0.5	0.0	0.1
Indiana	0.0	0.0	0.5	0.0	0.0
Iowa	0.0	0.0	0.6	0.1	0.0
Kansas	0.1	0.1	0.3	0.1	0.2
Kentucky	1.5	2.3	2.1	3.2	1.9
Louisiana	0.1	0.1	0.1	0.1	0.1
Maine	0.1	0.0	0.3	0.1	0.1
Maryland	0.0	0.0	0.3	0.0	0.0
Massachusetts	0.3	0.3	0.4	0.4	0.7
Michigan	0.0	0.0	0.5	0.0	0.0
Minnesota	4.6	6.6	1.4	7.3	7.4
Mississippi	0.0	0.1	0.3	0.1	0.1
Missouri	0.1	0.1	0.6	0.1	0.1
Montana	0.0	0.0	0.2	0.0	0.0
Nebraska	0.0	0.0	0.3	[7] 0.1	0.0
Nevada	0.7	1.3	1.3	1.1	2.3
New Hampshire	0.0	0.0	0.4	0.0	0.1
New Jersey	0.0	0.2	0.8	0.3	0.5
New Mexico	0.0	0.0	0.6	0.0	---
New York	0.2	0.6	0.5	[8] 2.1	2.0
North Carolina	0.0	0.0	0.5	0.0	0.0
North Dakota	0.1	0.1	1.7	0.3	0.2
Ohio	0.0	0.0	0.7	0.0	0.0
Oklahoma	0.9	1.2	1.4	1.9	[9] 2.6
Oregon	0.0	0.0	0.5	0.0	0.0
Pennsylvania	0.0	0.0	0.1	0.0	0.0
Rhode Island	8.9	9.0	0.6	18.5	18.9
South Carolina	-	-	1.0	-	-
South Dakota	0.0	0.0	0.5	0.0	0.0
Tennessee	0.0	0.0	0.7	0.0	0.0
Texas	0.0	[10] 0.0	0.8	[7] 0.0	0.0
Utah	0.0	0.0	0.1	0.1	0.1
Vermont	0.0	0.1	0.1	0.1	0.1
Virginia	-	-	0.5	0.2	0.0
Washington	9.1	10.6	0.4	11.0	11.2
West Virginia	0.1	0.3	0.3	0.5	0.2
Wisconsin	0.0	0.1	0.0	[11] 0.1	0.1
Wyoming	0.0	0.0	0.1	0.0	0.0
Puerto Rico	0.0	0.1	0.0	0.0	0.1
Virgin Islands	2.1	6.9	1.1	8.0	6.9
Guam	0.5	1.9	0.4	1.2	1.5
American Samoa	---	---	---	---	---
Northern Marianas	---	---	1.5	---	---

See footnotes at end of table.

Table A. Percentage of birth records on which specified items were not stated: United States and each State and territory, 2002— Con.

0.0 Quantity more than zero but less than 0.05.
--- Data not available.
- Quantity zero.
[1] Excludes data for Puerto Rico, Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas.
[2] California reports date last normal menses began but does not report clinical estimate of gestation.
[3] Indiana and New York State report tobacco use but do not report the average number of cigarettes smoked per day in standard categories; data for New York City are reported in standard categories.
[4] Kansas does not report Rh sensitization.
[5] South Dakota and the Commonwealth of the Northern Marianas report tobacco and alcohol use but do not report the average number of cigarettes smoked per day or the average number of drinks per week.
[6] Texas does not report genital herpes and uterine bleeding.
[7] Nebraska and Texas do not report birth injury.
[8] New York City does not report assisted ventilation less than 30 minutes and assisted ventilation of 30 minutes or more.
[9] Rates of "Other central nervous system anomalies" may be overstated for Oklahoma for 2002.
[10] Texas does not report anesthetic complications and fetal distress.
[11] Wisconsin does not report fetal alcohol syndrome.

Table B. Births by place of occurrence and residence for births occurring in the 50 States, the District of Columbia, U.S. territories, and other countries, 2002

Area	Occurrence	Residence
United States	4,027,376	4,021,726
Alabama	57,861	58,967
Alaska	9,845	9,938
Arizona	87,928	87,837
Arkansas	36,763	37,437
California	530,204	529,357
Colorado	68,537	68,418
Connecticut	42,657	42,001
Delaware	11,724	11,090
District of Columbia	14,988	7,498
Florida	205,680	205,579
Georgia	134,598	133,300
Hawaii	17,512	17,477
Idaho	20,449	20,970
Illinois	177,579	180,622
Indiana	85,506	85,081
Iowa	37,819	37,559
Kansas	39,655	39,412
Kentucky	52,735	54,233
Louisiana	65,120	64,872
Maine	13,372	13,559
Maryland	68,790	73,323
Massachusetts	81,697	80,645
Michigan	128,689	129,967
Minnesota	68,064	68,025
Mississippi	40,539	41,518
Missouri	76,368	75,251
Montana	11,018	11,049
Nebraska	25,515	25,383
Nevada	32,188	32,571
New Hampshire	13,943	14,442
New Jersey	111,813	114,751
New Mexico	27,350	27,753
New York State only	129,430	133,121
New York City only	122,934	118,294
North Carolina	118,178	117,335
North Dakota	8,877	7,757
Ohio	149,061	148,720
Oklahoma	49,237	50,387
Oregon	46,053	45,192
Pennsylvania	142,972	142,850
Rhode Island	13,559	12,894
South Carolina	52,162	54,570
South Dakota	11,015	10,698
Tennessee	82,609	77,482
Texas	377,750	372,450
Utah	50,314	49,182
Vermont	6,107	6,387
Virginia	97,390	99,672
Washington	78,579	79,028
West Virginia	21,130	20,712
Wisconsin	67,408	68,560
Wyoming	6,105	6,550
Occurrence in U.S. territories or foreign countries	-	5,650
Puerto Rico	-	11
Virgin Islands	-	25
Guam	-	-
American Samoa	-	-
Northern Marianas	-	-
Canada	-	174
Cuba	-	1
Mexico	-	4,935
Remainder of world	-	504

- Quantity zero.

Table C. Lower and upper 95 percent and 96 percent confidence limit factors for a birth rate based on a Poisson variable of 1 through 99 births, *B*

B	L(1- a=.95,*B*)	U(1- a =.95,*B*)	L(1- a =.96,*B*)	U(1- a =.96,*B*)
1	0.02532	5.57164	0.02020	5.83392
2	0.12110	3.61234	0.10735	3.75830
3	0.20622	2.92242	0.18907	3.02804
4	0.27247	2.56040	0.25406	2.64510
5	0.32470	2.33367	0.30591	2.40540
6	0.36698	2.17658	0.34819	2.23940
7	0.40205	2.06038	0.38344	2.11666
8	0.43173	1.97040	0.41339	2.02164
9	0.45726	1.89831	0.43923	1.94553
10	0.47954	1.83904	0.46183	1.88297
11	0.49920	1.78928	0.48182	1.83047
12	0.51671	1.74680	0.49966	1.78566
13	0.53246	1.71003	0.51571	1.74688
14	0.54671	1.67783	0.53027	1.71292
15	0.55969	1.64935	0.54354	1.68289
16	0.57159	1.62394	0.55571	1.65610
17	0.58254	1.60110	0.56692	1.63203
18	0.59266	1.58043	0.57730	1.61024
19	0.60207	1.56162	0.58695	1.59042
20	0.61083	1.54442	0.59594	1.57230
21	0.61902	1.52861	0.60435	1.55563
22	0.62669	1.51401	0.61224	1.54026
23	0.63391	1.50049	0.61966	1.52602
24	0.64072	1.48792	0.62666	1.51278
25	0.64715	1.47620	0.63328	1.50043
26	0.65323	1.46523	0.63954	1.48888
27	0.65901	1.45495	0.64549	1.47805
28	0.66449	1.44528	0.65114	1.46787
29	0.66972	1.43617	0.65652	1.45827
30	0.67470	1.42756	0.66166	1.44922
31	0.67945	1.41942	0.66656	1.44064
32	0.68400	1.41170	0.67125	1.43252
33	0.68835	1.40437	0.67575	1.42480
34	0.69253	1.39740	0.68005	1.41746
35	0.69654	1.39076	0.68419	1.41047
36	0.70039	1.38442	0.68817	1.40380
37	0.70409	1.37837	0.69199	1.39743
38	0.70766	1.37258	0.69568	1.39134
39	0.71110	1.36703	0.69923	1.38550
40	0.71441	1.36172	0.70266	1.37991
41	0.71762	1.35661	0.70597	1.37454
42	0.72071	1.35171	0.70917	1.36938
43	0.72370	1.34699	0.71227	1.36442
44	0.72660	1.34245	0.71526	1.35964
45	0.72941	1.33808	0.71816	1.35504
46	0.73213	1.33386	0.72098	1.35060
47	0.73476	1.32979	0.72370	1.34632
48	0.73732	1.32585	0.72635	1.34218
49	0.73981	1.32205	0.72892	1.33818
50	0.74222	1.31838	0.73142	1.33431

Table C. Lower and upper 95 percent and 96 percent confidence limit factors for a birth rate based on a Poisson variable of 1 through 99 births, *B* — Con.

B	L(1- a=.95,*B*)	U(1- a =.95,*B*)	L(1- a =.96,*B*)	U(1- a =.96,*B*)
51	0.74457	1.31482	0.73385	1.33057
52	0.74685	1.31137	0.73621	1.32694
53	0.74907	1.30802	0.73851	1.32342
54	0.75123	1.30478	0.74075	1.32002
55	0.75334	1.30164	0.74293	1.31671
56	0.75539	1.29858	0.74506	1.31349
57	0.75739	1.29562	0.74713	1.31037
58	0.75934	1.29273	0.74916	1.30734
59	0.76125	1.28993	0.75113	1.30439
60	0.76311	1.28720	0.75306	1.30152
61	0.76492	1.28454	0.75494	1.29873
62	0.76669	1.28195	0.75678	1.29601
63	0.76843	1.27943	0.75857	1.29336
64	0.77012	1.27698	0.76033	1.29077
65	0.77178	1.27458	0.76205	1.28826
66	0.77340	1.27225	0.76373	1.28580
67	0.77499	1.26996	0.76537	1.28340
68	0.77654	1.26774	0.76698	1.28106
69	0.77806	1.26556	0.76856	1.27877
70	0.77955	1.26344	0.77011	1.27654
71	0.78101	1.26136	0.77162	1.27436
72	0.78244	1.25933	0.77310	1.27223
73	0.78384	1.25735	0.77456	1.27014
74	0.78522	1.25541	0.77598	1.26810
75	0.78656	1.25351	0.77738	1.26610
76	0.78789	1.25165	0.77876	1.26415
77	0.78918	1.24983	0.78010	1.26223
78	0.79046	1.24805	0.78143	1.26036
79	0.79171	1.24630	0.78272	1.25852
80	0.79294	1.24459	0.78400	1.25672
81	0.79414	1.24291	0.78525	1.25496
82	0.79533	1.24126	0.78648	1.25323
83	0.79649	1.23965	0.78769	1.25153
84	0.79764	1.23807	0.78888	1.24987
85	0.79876	1.23652	0.79005	1.24824
86	0.79987	1.23499	0.79120	1.24664
87	0.80096	1.23350	0.79233	1.24507
88	0.80203	1.23203	0.79344	1.24352
89	0.80308	1.23059	0.79453	1.24201
90	0.80412	1.22917	0.79561	1.24052
91	0.80514	1.22778	0.79667	1.23906
92	0.80614	1.22641	0.79771	1.23762
93	0.80713	1.22507	0.79874	1.23621
94	0.80810	1.22375	0.79975	1.23482
95	0.80906	1.22245	0.80074	1.23345
96	0.81000	1.22117	0.80172	1.23211
97	0.81093	1.21992	0.80269	1.23079
98	0.81185	1.21868	0.80364	1.22949
99	0.81275	1.21746	0.80458	1.22822

Table D. Sources for resident population and population including Armed Forces abroad: Birth- and death-registration States, 1900–1932, and United States, 1900–2002

Year	Source
2002	National Center for Health Statistics. Postcensal estimates of the resident population of the United States as of July 1, 2002, by State ar county, age, bridged race, sex, and Hispanic origin. File pcen v2002.txt. Internet released, August 1, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
2001	National Center for Health Statistics. Postcensal estimates of the resident population of the United States as of July 1, 2001, by State ar county, age, bridged race, sex, and Hispanic origin. File pcen v2002.txt. Internet released, August 1, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
2001	National Center for Health Statistics. Postcensal estimates of the resident population of the United States as of July 1, 2001, by age, bridged race, sex, and Hispanic origin. File pcen v2001.txt. Internet released, January 12, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
2000	National Center for Health Statistics. Estimates of the April 1, 2000, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S.Census Bureau. File br040100.txt. Internet released, January 12, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1999	National Center for Health Statistics. Intercensal estimates of the July 1, 1999, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1999.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1998	National Center for Health Statistics. Intercensal estimates of the July 1, 1998, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1999.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1997	National Center for Health Statistics. Intercensal estimates of the July 1, 1997, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1997.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm
1996	National Center for Health Statistics. Intercensal estimates of the July 1, 1996, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1996.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm
1995	National Center for Health Statistics. Intercensal estimates of the July 1, 1995, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1995.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1994	National Center for Health Statistics. Intercensal estimates of the July 1, 1994, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1994.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1993	National Center for Health Statistics. Intercensal estimates of the July 1, 1993, United States resident population by State and county, b age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1993.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1992	National Center for Health Statistics. Intercensal estimates of the July 1, 1992, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1992.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1991	National Center for Health Statistics. Intercensal estimates of the July 1, 1991, United States resident population by State and county, age, sex, bridged race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. File icen1991.txt. Internet released, April 15, 2003. Available at: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.
1990	U.S. Bureau of the Census, Unpublished data from the 1990 census. 1990 CPH-L-74 and unpublished data consistent with *Current Population Reports*, Series P-25, No. 1095, Feb. 1993.
1989	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 1057, Mar. 1990.
1988	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 1045, Jan. 1990.
1986–87	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 1022, Mar. 1988.
1985	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 1000, Feb. 1987.
1984	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 985, Apr. 1986.
1983	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 965, Mar. 1985.
1982	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 949, May 1984.
1981	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 929, May 1983.
1980	U.S. Bureau of the Census, *U.S. Census of Population: 1980, Number of Inhabitants*, PC80-1-A1, United States Summary, 1983.
1971–79	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 917, July 1982.
1970	U.S. Bureau of the Census, *U.S. Census of Population: 1970, Number of Inhabitants, Final Report* PC(1)-A1, United States Summary,
1961–69	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 519, April 1974.
1960	U.S. Bureau of the Census, *U.S. Census of Population: 1960, Number of Inhabitants*, PC(1)-A1, United States Summary, 1964.
1951–59	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 310, June 30, 1965.
1940–50	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 499, May 1973.
1930–39	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 499, May 1973, and National Office of Vital Statistics, *Vital Statistics Rates in the United States*, 1900–1940, 1947.
1920–29	National Office of Vital Statistics, *Vital Statistics Rates in the United States*, 1900–1940, 1947.
1917–19	Same as for 1930–39.
1900–1916	Same as for 1920–29.

Table E. Percentage net undercount, by age, sex, and race/Hispanic origin: United States, April 1, 2000

Characteristic	Estimate (%)
Total	-0.49
Age/sex	
10–17 Male and female	-1.32
18–29 Male	1.12
18–29 Female	-1.39
30–49 Male	2.01
30–49 Female	-0.60
50 years and over male	-0.80
50 years and over female	-2.53
Race/Hispanic origin	
Non-Hispanic white	-1.13
Non-Hispanic black	1.84
Hispanic	0.71

SOURCE: Fenstermaker D, Haines D. Summary of estimated net coverage. DSSD A.C.E. Revision II Memorandum Series #PP-54. Washington: U.S. Census Bureau. 2002.

Table 4–1. Population of birth- and death-registration States, 1900–1932, and United States, 1900–2002

[Population enumerated as of April 1 for 1940, 1950, 1960, 1970, 1980, 1990, and 2000 and estimated as of July 1 for all other years]

Year	United States[1]		Year	United States[1]		Birth-registration States		Death-registration States	
	Population including Armed Forces abroad	Population residing in area		Population including Armed Forces abroad	Population residing in area	Number of States[2]	Population residing in area	Number of States[2]	Population residing in area
2002	288,600,204	288,368,706	1950	151,132,000	150,697,361	. . .	. . .	. . .	. . .
2001	285,024,000	284,796,887	1949	149,188,000	148,665,000	. . .	. . .	. . .	. . .
2000	281,652,000	281,421,906	1948	146,631,000	146,093,000	. . .	. . .	. . .	. . .
1999	279,294,713	279,040,168	1947	144,126,000	143,446,000	. . .	. . .	. . .	. . .
1998	276,115,288	275,854,104	1946	141,389,000	140,054,000	. . .	. . .	. . .	. . .
1997	272,911,760	272,646,925	1945	139,928,000	132,481,000	. . .	. . .	. . .	. . .
1996	269,667,391	269,394,284	1944	138,397,000	132,885,000	. . .	. . .	. . .	. . .
1995	266,557,091	266,278,393	1943	136,739,000	134,245,000	. . .	. . .	. . .	. . .
1994	263,435,673	263,125,821	1942	134,860,000	133,920,000	. . .	. . .	. . .	. . .
1993	260,255,352	259,918,588	1941	133,402,000	133,121,000	. . .	. . .	. . .	. . .
1992	256,894,189	256,514,224	1940	131,820,000	131,669,275	. . .	. . .	. . .	. . .
1991	253,492,503	252,980,941	1939	131,028,000	130,879,718	. . .	. . .	. . .	. . .
1990	249,225,000	248,709,873	1938	129,969,000	129,824,939	. . .	. . .	. . .	. . .
1989	247,342,000	246,819,000	1937	128,961,000	128,824,829	. . .	. . .	. . .	. . .
1988	245,021,000	244,499,000	1936	128,181,000	128,053,180	. . .	. . .	. . .	. . .
1987	242,804,000	242,289,000	1935	127,362,000	127,250,232	. . .	. . .	. . .	. . .
1986	240,651,000	240,133,000	1934	126,485,000	126,373,773	. . .	. . .	. . .	. . .
1985	238,466,000	237,924,000	1933	125,690,000	125,578,763	. . .	. . .	. . .	. . .
1984	236,348,000	235,825,000	1932	124,949,000	124,840,471	47	118,903,899	47	118,903,899
1983	234,307,000	233,792,000	1931	124,149,000	124,039,648	46	117,455,229	47	118,148,987
1982	232,188,000	231,664,000	1930	123,188,000	123,076,741	46	116,544,946	47	117,238,278
1981	229,966,000	229,466,000	1929	- - -	121,769,939	46	115,317,450	46	115,317,450
1980	227,061,000	226,545,805	1928	- - -	120,501,115	44	113,636,160	44	113,636,160
1979	225,055,000	224,567,000	1927	- - -	119,038,062	40	104,320,830	42	107,084,532
1978	222,585,000	222,095,000	1926	- - -	117,399,225	35	90,400,590	41	103,822,683
1977	220,239,000	219,760,000	1925	- - -	115,831,963	33	88,294,564	40	102,031,555
1976	218,035,000	217,563,000	1924	- - -	114,113,463	33	87,000,295	39	99,318,098
1975	215,973,000	215,465,000	1923	- - -	111,949,945	30	81,072,123	38	96,788,197
1974	213,854,000	213,342,000	1922	- - -	110,054,778	30	79,560,746	37	92,702,901
1973	211,909,000	211,357,000	1921	- - -	108,541,489	27	70,807,090	34	87,814,447
1972	209,896,000	209,284,000	1920	- - -	106,466,420	23	63,597,307	34	86,079,263
1971	207,661,000	206,827,000	1919	105,063,000	104,512,110	22	61,212,076	33	83,157,982
1970	204,270,000	203,211,926	1918	104,550,000	103,202,801	20	55,153,782	30	79,008,412
1969	202,677,000	201,385,000	1917	103,414,000	103,265,913	20	55,197,952	27	70,234,775
1968	200,706,000	199,399,000	1916	- - -	101,965,984	11	32,944,013	26	66,971,177
1967	198,712,000	197,457,000	1915	- - -	100,549,013	10	31,096,697	24	61,894,847
1966	196,560,000	195,576,000	1914	- - -	99,117,567	. . .	. . .	24	60,963,309
1965	194,303,000	193,526,000	1913	- - -	97,226,814	. . .	. . .	23	58,156,740
1964	191,889,000	191,141,000	1912	- - -	95,331,300	. . .	. . .	22	54,847,700
1963	189,242,000	188,483,000	1911	- - -	93,867,814	. . .	. . .	22	53,929,644
1962	186,538,000	185,771,000	1910	- - -	92,406,536	. . .	. . .	20	47,470,437
1961	183,691,000	182,992,000	1909	- - -	90,491,525	. . .	. . .	18	44,223,513
1960	179,933,000	179,323,175	1908	- - -	88,708,976	. . .	. . .	17	38,634,759
1959	177,264,000	176,513,000	1907	- - -	87,000,271	. . .	. . .	15	34,552,837
1958	174,141,000	173,320,000	1906	- - -	85,436,556	. . .	. . .	15	33,782,288
1957	171,274,000	170,371,000	1905	- - -	83,819,666	. . .	. . .	10	21,767,980
1956	168,221,000	167,306,000	1904	- - -	82,164,974	. . .	. . .	10	21,332,076
1955	165,275,000	164,308,000	1903	- - -	80,632,152	. . .	. . .	10	20,943,222
1954	162,391,000	161,164,000	1902	- - -	79,160,196	. . .	. . .	10	20,582,907
1953	159,565,000	158,242,000	1901	- - -	77,585,128	. . .	. . .	10	20,237,453
1952	156,954,000	155,687,000	1900	- - -	76,094,134	. . .	. . .	10	19,965,446
1951	154,287,000	153,310,000							

- - - Data not available.

... Category not applicable.

[1] Alaska included beginning 1959 and Hawaii, 1960.

[2] The District of Columbia is not included in "Number of States," but it is represented in all data shown for each year.

SOURCE: Published and unpublished data from the U.S. Census Bureau; see text and table D.

Table 4-2. Estimated total population by race, and estimated female population by age and race: United States, 2002

[Populations estimated as of July 1]

Age	All races	White	Black	American Indian	Asian or Pacific Islander
Total population	288,368,706	234,746,440	37,747,692	3,076,095	12,798,479
Female population					
15-44 years	62,044,142	48,998,121	9,026,073	731,071	3,288,877
10-14 years	10,311,553	7,994,986	1,731,004	150,875	434,688
15-19 years	9,905,023	7,764,527	1,559,455	143,268	437,773
15-17 years	5,967,384	4,676,219	946,988	86,700	257,477
18-19 years	3,937,639	3,088,308	612,467	56,568	180,296
20-24 years	9,863,491	7,706,591	1,531,763	127,401	497,736
25-29 years	9,331,760	7,247,653	1,380,362	110,456	593,289
30-34 years	10,393,768	8,164,321	1,475,044	112,424	641,979
35-39 years	10,961,381	8,730,699	1,534,119	117,384	579,179
40-44 years	11,588,719	9,384,330	1,545,330	120,138	538,921
45-49 years	10,810,307	8,844,142	1,366,556	105,700	493,909

NOTE: These population counts are estimated based on the 2000 census; see "Technical Notes." Race categories are consistent with the 1977 Office of Management and Budget guidelines.

SOURCE: U.S. Census Bureau. See reference 28.

Table 4–3. Estimated total population by specified Hispanic origin and estimated female population by age and specified Hispanic origin and by race for women of non-Hispanic origin: United States, 2002

[Populations estimated as of July 1]

Age	Hispanic					Non-Hispanic		
	Total	Mexican	Puerto Rican	Cuban	Other Hispanic[1]	Total[2]	White	Black
Total population	38,761,304	25,927,404	3,491,092	1,418,217	7,924,566	249,607,402	198,691,529	36,145,193
Female population								
15–44 years	9,282,682	6,102,378	878,299	241,087	2,060,918	52,761,460	40,394,467	8,619,604
10–14 years	1,724,621	1,224,988	150,149	34,898	314,587	8,586,932	6,409,899	1,649,550
15–19 years	1,532,680	1,033,878	162,899	34,194	301,711	8,372,343	6,351,004	1,491,961
15–17 years	922,312	615,761	95,008	22,870	188,675	5,045,072	3,826,729	905,629
18–19 years	610,368	418,117	67,891	11,324	113,036	3,327,271	2,524,275	586,332
20–24 years	1,614,569	1,113,026	137,167	34,815	329,566	8,248,922	6,216,387	1,457,446
25–29 years	1,694,283	1,177,138	152,759	37,297	327,084	7,637,477	5,673,667	1,306,663
30–34 years	1,659,543	1,085,092	153,026	31,013	390,414	8,734,225	6,622,138	1,402,937
35–39 years	1,495,141	950,362	140,021	53,883	350,873	9,466,240	7,341,768	1,469,838
40–44 years	1,286,466	742,882	132,427	49,885	361,270	10,302,253	8,189,503	1,490,759
45–49 years	1,028,664	610,181	101,147	45,103	272,237	9,781,643	7,888,991	1,322,234

[1]Includes Central and South American and other and unknown Hispanic.

[2]Includes races other than white and black.

NOTE: These population counts are estimated based on the 2000 census; see "Technical Notes." Race categories are consistent with the 1977 Office of Management and Budget guidelines.

SOURCE: U.S. Census Bureau. Population Estimates for 2000 based on unpublished tabulations prepared by the Housing and Household Economic Statistics Division. 2001.

Table 4-4. Estimated total population and female population aged 15-44 years: United States, each State, and territory: July 1, 2002

[Figures include Armed Forces stationed in each area and exclude those stationed outside the United States]

State	Total	Female 15-44 years
United States	288,368,706	62,044,142
Alabama	4,486,508	964,076
Alaska	643,786	135,128
Arizona	5,456,453	1,129,623
Arkansas	2,710,079	562,512
California	35,116,033	7,753,983
Colorado	4,506,542	986,708
Connecticut	3,460,503	714,099
Delaware	807,385	178,365
District of Columbia	570,898	141,808
Florida	16,713,149	3,290,358
Georgia	8,560,310	1,949,647
Hawaii	1,244,898	254,652
Idaho	1,341,131	284,118
Illinois	12,600,620	2,734,050
Indiana	6,159,068	1,312,372
Iowa	2,936,760	609,101
Kansas	2,715,884	573,685
Kentucky	4,092,891	895,803
Louisiana	4,482,646	991,485
Maine	1,294,466	272,137
Maryland	5,458,137	1,209,363
Massachusetts	6,427,803	1,423,025
Michigan	10,050,446	2,140,053
Minnesota	5,019,720	1,096,832
Mississippi	2,871,782	631,498
Missouri	5,672,579	1,212,701
Montana	909,453	183,288
Nebraska	1,729,180	365,235
Nevada	2,173,491	449,407
New Hampshire	1,275,056	275,577
New Jersey	8,590,303	1,806,387
New Mexico	1,855,059	392,488
New York	19,157,532	4,200,848
North Carolina	8,320,146	1,795,328
North Dakota	634,110	132,083
Ohio	11,421,268	2,408,493
Oklahoma	3,493,714	732,645
Oregon	3,521,515	729,844
Pennsylvania	12,335,091	2,532,890
Rhode Island	1,069,725	236,192
South Carolina	4,107,183	898,778
South Dakota	761,063	156,684
Tennessee	5,797,289	1,246,504
Texas	21,779,893	4,830,280
Utah	2,316,256	542,919
Vermont	616,592	130,731
Virginia	7,293,542	1,609,552
Washington	6,068,996	1,312,243
West Virginia	1,801,873	363,147
Wisconsin	5,441,196	1,162,494
Wyoming	498,703	102,923
Puerto Rico	3,858,806	855,825
Virgin Islands	108,810	22,971
Guam	161,057	36,377
American Samoa	57,716	12,842
Northern Marianas	74,003	28,608
Corrrected Totals:	288,368,706	62,044,142

SOURCE: National Center for Health Statistics. Unpublished estimates of the July 1, 2002, United States population by age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. 2003.

Technical Notes

Nature and sources of data

Data in this report are based on information from all death certificates filed in the 50 States and the District of Columbia and are processed by the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS). Data for 2002 are based on records of deaths that occurred during 2002 and were received as of November 18, 2003. The U.S. Standard Certificate of Death—which is used as a model by the States—was last revised in 1989; for additional details see the 1989 revision of the U.S. standard certificates and reports (32) and Technical Appendix of Vital Statistics of the United States, 1989, Volume II, Mortality, part A (33). Data for Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Northern Marianas are included in tables showing data by State, but are not included in U.S. totals.

Mortality statistics are based on information coded by the States and provided to the National Center for Health Statistics (NCHS) through the Vital Statistics Cooperative Program (VSCP) and from copies of the original certificates received by NCHS from the State registration offices. In 2002 all the States and the District of Columbia participated in this program and submitted part or all of the mortality data for 2002 in electronic data files to NCHS. All States provided precoded medical (cause-of-death) data to NCHS except Illinois, Kentucky, Ohio, and West Virginia, and the District of Columbia. For 2002 all States submitted precoded demographic data for all deaths.

Data for the entire United States refer to events occurring within the United States. Data shown for geographic areas are by place of residence. Beginning with 1970, mortality statistics for the United States exclude deaths of nonresidents of the United States. All data exclude fetal deaths.

Mortality statistics for Puerto Rico, Virgin Islands, American Samoa, and Northern Marianas exclude deaths of nonresidents of Puerto Rico, Virgin Islands, American Samoa, and Northern Marianas, respectively. For Guam, however, mortality statistics exclude deaths that occurred to a resident of any place other than Guam or the United States.

Cause-of-death classification

The mortality statistics presented in this report were compiled in accordance with World Health Organization (WHO) regulations, which specify that member nations classify and code causes of death in accordance with the current revision of the *International Classification of Diseases* (ICD). The ICD provides the basic guidance used in virtually all countries to code and classify causes of death. Effective with deaths occurring in 1999, the United States began using the Tenth Revision of this classification (ICD–10) (7). For earlier years causes of death were classified according to the revisions then in use—1979–98, Ninth Revision; 1968–78, Eighth Revision, adapted for use in the United States; 1958–67, Seventh Revision; and 1949–57, Sixth Revision.

Changes in classification of causes of death due to these revisions may result in discontinuities in cause-of-death trends. Consequently, cause-of-death comparisons among revisions require consideration of comparability ratios and, where available, estimates of their standard errors. Comparability ratios between the Ninth and Tenth Revisions, between the Eighth and Ninth Revisions, between the Seventh and Eighth Revisions, and between the Sixth and Seventh Revisions may be found in other NCHS reports (21,34–36).

The ICD not only details disease classification but also provides definitions, tabulation lists, the format of the death certificate, and the rules for coding cause of death. Cause-of-death data presented in this publication were coded by procedures outlined in annual issues of the NCHS *Instruction Manual* (37,38). It includes rules for selecting the underlying cause of death for tabulation purposes, definitions, tabulation lists, and regulations on the use of the ICD.

Before data for 1968, mortality medical data were based on manual coding of an underlying cause of death for each certificate in accordance with WHO rules. Effective with data year 1968, NCHS converted to computerized coding of the underlying cause and manual coding of all causes (multiple causes) on the death certificate. In this system, called "Automated Classification of Medical Entities" (ACME) (39), multiple cause codes serve as inputs to the computer software that employs WHO rules to select the underlying cause. All cause-of-death data in this report are coded using ACME.

The ACME system is used to select the underlying cause of death for all death certificates in the United States. In addition, NCHS has developed two computer systems as inputs to ACME. Beginning with 1990 data, the Mortality Medical Indexing, Classification, and Retrieval system (MICAR) (40,41), was introduced to automate coding multiple causes of death. In addition, MICAR provides more detailed information on the conditions reported on death certificates than is available through the ICD code structure. Then, beginning with data year 1993, SuperMICAR, an enhancement of the MICAR system, was introduced. SuperMICAR allows for literal entry of the multiple cause-of-death text as reported by the certifier. This information is then automatically processed by the MICAR and ACME computer systems. Records that cannot be automatically processed by MICAR or SuperMICAR are manually multiple-cause coded and then further processed through ACME.

For 2002 approximately 77 percent of the Nation's death records were multiple-cause coded using SuperMICAR and 23 percent, using MICAR only. This represents data from 41 States, New York City and the District of Columbia that were coded by SuperMICAR and data from 9 States that were coded by MICAR.

In this report tabulations of cause-of-death statistics are based solely on the underlying cause of death. The underlying cause is defined by WHO as "the disease or injury which initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury" (7). It is selected from the conditions entered by the physician in the cause-of-death section of the death certificate. When more than one cause or condition is entered by the physician, the underlying cause is determined by the sequence of conditions on the certificate, provisions of the ICD, and associated selection rules and modifications. Generally, more medical information is reported on death certificates than is directly reflected in the underlying cause of death. This is captured in NCHS multiple cause-of-death statistics (42–44).

Tabulation lists and cause-of-death ranking

Tabulation lists for ICD–10 are published in the NCHS Instruction Manual, Part 9, ICD–10 Cause-of-Death Lists for Tabulating Mortality Statistics (updated October 2002) (45). For this report, two

tabulation lists are used, namely, the List of 113 Selected Causes of Death used for deaths of all ages, and the List of 130 Selected Causes of Infant Death used for infants. These lists are also used to rank leading causes of death for the two population groups. For the List of 113 Selected Causes of Death, the group titles Major cardiovascular diseases (ICD–10 codes I00–I78) and Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (ICD–10 codes R00–R99) are not ranked. In addition, category titles that begin with the words "Other" and "All other" are not ranked to determine the leading causes of death. When one of the titles that represents a subtotal is ranked (for example, Tuberculosis (ICD–10 codes A16–A19)), its component parts are not ranked (in this case, Respiratory tuberculosis (ICD–10 code A16) and Other tuberculosis (ICD–10 codes A17–A19)). For the List of 130 Selected Causes of Infant Death, the same ranking procedures are used, except that the category Major cardiovascular diseases is not in the list. More detail regarding ranking procedures can be found in "Deaths: Leading Causes for 2002" (3).

Leading cause-of-death trends, discussed in this report, are based on cause-of-death data according to ICD–10 for 1999–2002, and on data for the most comparable ICD–9 cause-of-death titles for 1979–98. Tables showing ICD–9 categories that are comparable to the ICD–10 titles in the list of 113 selected causes of death may be found in "Comparability of Cause of Death Between ICD–9 and ICD–10: Preliminary Estimates" (21) and "Deaths: Final Data for 1999" (22). Although in some cases categories from the list of 113 selected causes are identical to those in the old list of 72 selected causes of death used with ICD–9, it is important to note that many of these categories are not comparable with categories in the list of 72 selected causes even though the cause-of-death titles may be the same.

Trend data for 1978–98 that are classified by ICD–9 but are sorted into the list of 113 selected causes of death developed for ICD–10 can be found on the mortality Web site at http://www.cdc.gov/nchs/data/statab/hist001r.pdf.

Revision of the ICD and resulting changes in classification and rules for selecting the underlying cause of death have important implications for the analysis of mortality trends by cause of death. For some causes of death the discontinuity in trend can be substantial (21). Therefore, considerable caution should be used in analyzing cause-of-death trends for periods of time that extend across more than one revision of the ICD.

Codes for terrorism

Beginning with data for 2001, NCHS introduced categories *U01–*U03 for classifying and coding deaths due to acts of terrorism. The asterisks before the category codes indicate that they are not part of the *International Classification of Diseases, Tenth Revision* (ICD–10). Deaths classified to the terrorism categories are included in the categories for Assault (homicide) and Intentional self-harm (suicide) in the 113 cause-of-death list and in the category for Assault (homicide) in the 130 cause-of-death list for infants. Additional information on these new categories can be found at http://www.cdc.gov/nchs/about/otheract/icd9/terrorism_code.htm.

Race and Hispanic origin

Race and Hispanic origin are reported separately on the death certificate. Therefore, data shown by race include persons of Hispanic and non-Hispanic origin, and data for Hispanic origin include persons of any race. In this report, unless otherwise specified, deaths of Hispanic origin are included in the totals for each race group—white, black, American Indian, and Asian or Pacific Islander (API)—according to the decedent's race as reported on the death certificate. Data shown for Hispanic persons include all persons of Hispanic origin of any race.

Mortality data for the Hispanic-origin population are based on deaths to residents of all 50 States and the District of Columbia. Data year 1997 was the first year that mortality data for the Hispanic population were available for the entire United States.

Quality of race and Hispanic origin data—Death rates for Hispanic, American Indian, and API persons should be interpreted with caution because of inconsistencies in reporting Hispanic origin or race on the death certificate as compared with race on censuses, surveys, and birth certificates. Studies have shown under-reporting on death certificates of American Indians, API, and Hispanic decedents; and undercounts of these groups in the censuses (17,46).

A number of studies have been conducted on the reliability of race reported on the death certificate by comparing race on the death certificate with that reported on another data collection instrument, such as the census or a survey. Differences may arise because of differences in who provides race information on the compared records. Race information on the death certificate is reported by the funeral director as provided by an informant or in the absence of an informant, on the basis of observation. In contrast, race on the census or on the Current Population Survey (CPS) is obtained while the individual is alive and is self-reported or reported by another member of the household familiar with the individual and, therefore, may be considered more valid. A high level of agreement between the death certificate and the census or survey report is essential to assure unbiased death rates by race.

Studies (46,47) show that a person self-reported as American Indian or Asian on census or survey records was sometimes reported as white on the death certificate. The net effect of misclassification is an underestimation of deaths and death rates for races other than white and black. In addition, undercoverage of minority groups in the census and resultant population estimates, introduces biases into death rates by race (6,17,48). Estimates of the approximate effect of the combined bias due to race misclassification on death certificates and under-enumeration on the 1990 census are as follows: white, –1.0 percent; black,–5.0; American Indian, +20.6; Asian or Pacific Islander, +10.7 (17). Comparable information is not yet available on the 2000 census.

The National Longitudinal Mortality Study (NLMS) examined the reliability of Hispanic origin reported on 43,520 death certificates with that reported on a total of 12 Current Population Surveys conducted by the U.S. Bureau of the Census for the years 1979–85 (17). In this study, agreement—on a record-by-record basis—was 89.7 percent for any report of Hispanic origin. The ratio of deaths for CPS divided by deaths for death certificate was 1.07 indicating net underreporting of Hispanic origin on death certificates by 7 percent as compared with self-reports on the surveys. Death rates for the Hispanic-origin population are also affected by under-coverage of this population group in the census and resultant population estimates; the estimated net correction, taking into account both sources of bias, is 1.6 percent (17,48).

Other races and race not stated—Beginning in 1992 all records coded as "Other races" (0.04 percent of the total deaths in 2002) were

assigned to the specified race of the previous record. Records for which race was unknown, not stated, or not classifiable (0.08 percent) were assigned the race designation of the previous record.

Infant and maternal mortality rates—For 1989–2002, as in previous years, infant and maternal deaths continue to be tabulated by the race of the decedent. However, beginning with the 1989 data year, the method of tabulating live births by race was changed from race of parents to race of mother as stated on the birth certificate. This change affects infant and maternal mortality rates because live births are the denominators of these rates (33,49). To improve continuity and ease of interpretation, trend data by race in this report have been retabulated by race of mother for all years beginning with the 1980 data year.

Quantitatively, the change in the basis for tabulating live births by race results in more white births and fewer black births and births of other races. Consequently, infant and maternal mortality rates under the new tabulating procedure tend to be about 2 percent lower for white infants and about 5 percent higher for black infants than when they are computed by the previous method of tabulating live births by race of parents. Rates for most other minority races also are higher when computed by race of mother (49,50).

Infant mortality rates for the Hispanic-origin population are based on numbers of resident infant deaths reported to be of Hispanic origin and numbers of resident live births by Hispanic origin of mother for the United States. In computing infant mortality rates, deaths and live births of unknown origin are not distributed among the specified Hispanic and non-Hispanic groups. In 2002 the percent of infant deaths of unknown origin was 0.3 and the percent of live births to mothers of unknown origin was 0.6 for the United States.

Small numbers of infant deaths for specific Hispanic-origin groups result in infant mortality rates subject to relatively large random variation (see "Random variation"). Infant mortality rates by Hispanic origin are less subject to reporting error when based on linked files of infant deaths and live births (30).

Infant mortality rates calculated from the general mortality file for specified race and/or Hispanic origin are in error because of reporting problems that affect the classification of race and Hispanic origin on the birth and death certificates for the same infant. Infant mortality rates by specified race and Hispanic origin are more accurate when based on the linked file of infant deaths and live births (30). The linked file computes infant mortality rates using the race and/or Hispanic origin of the mother from the birth certificate in both the numerator and denominator of the rate. In addition, mother's race and/or Hispanic origin from the birth certificate is considered to be more accurately reported than infant's race and/or Hispanic origin from the death certificate because, on the birth certificate, race is generally reported by the mother at the time of delivery whereas, on the death certificate, infant's race and/or Hispanic origin is reported by an informant, usually the mother but sometimes by the funeral director. Estimates of reporting errors have been made by comparing rates based on the linked files with those in which the race of infant death is based on information from the death certificate (17,30).

Life tables

The life table provides a comprehensive measure of the effect of mortality on life expectancy. It is composed of sets of values showing the mortality experience of a hypothetical group of infants born at the same time and subject throughout their lifetime to the age-specific death rates of a particular time period, usually a given year. Beginning with final data reported for 1997, the life table methodology was changed from previous annual reports. Previously, U.S. life tables were abridged and constructed by reference to a standard table (51). In addition, the age range for these life tables was limited to 5-year age groups ending with the age group 85 years and over.

Beginning with 1997 mortality data, a revised life table methodology was used to construct complete life tables by single years of age that extend to age 100 (52) using a methodology similar to that of the decennial life tables (53). The advantages of the new over the previous methodology are its comparability with decennial life table methodology, greater accuracy, and greater age detail. A comparison of the two methods shows small differences in resulting values for life expectancy (52). Although the new method produces complete life tables, that is, life tables by single years of age, life table data shown in this report are summarized in 5-year age groupings. To calculate the probability of dying at each age, the revised methodology uses vital statistics death rates for ages under 85 years and mortality data from the Medicare program for ages over 85 years. Medicare data were used to model the probability of dying at ages 85 and over because the data are shown to be significantly more reliable than vital statistics data at the oldest ages (54).

The life tables presented in this report use a slight modification of the new life table method introduced in 1997 as a result of a change in the age detail of populations received from the U.S. Census Bureau. Populations for 2000, 2001 and 2002 were provided by single year of age up to age 84, followed by "85 years and over," and as a result it was not possible to apply the same smoothing technique that has been used when population figures in single years of age up to ages "100 years and over" were available. Accordingly, Medicare data were used to estimate the probability of dying by single year of age for ages up to "100 years and over."

Revised life expectancies were not computed for 1991–99 because revised intercensal populations, consistent with the 2000 census, were not available by single years of age for the 1990s as of the writing of this report.

Causes of death contributing to changes in life expectancy

Causes of death contributing to changes in life expectancy were estimated using a life table partitioning technique. The method partitions changes into component additive parts. This method identifies the causes of death having the greatest influence, positive or negative, on changes in life expectancy (18,55).

Injury mortality by mechanism and intent

Injury mortality data are presented using an alternative framework in table 18. In this framework, causes of injury deaths are organized principally by mechanism (e.g. firearm or poisoning), and secondarily by manner, or intent of death (e.g. unintentional, suicide, homicide, etc.).

In addition, the number of deaths for selected causes in this framework may differ from those shown in tables that use the standard mortality tabulation lists. Following WHO conventions, standard mortality tabulations (table 10) present external causes of death (ICD–10 codes *U01–*U03,V01–Y89). In contrast, the alternative

framework (table 18) excludes deaths classified to Complications of medical and surgical care (ICD–10 codes Y40–Y84,Y88). For additional information on injury data presented in this framework, see http://www.cdc.gov/nchs/about/otheract/ice/matrix10.htm and "Deaths: Injuries, 2002" (4).

Codes for firearm deaths

Causes of death attributable to firearm mortality include ICD–10 codes *U01.4, Terrorism involving firearms (homicide); W32–W34, Accidental discharge of firearms; X72–X74, Intentional self-harm (suicide) by discharge of firearms; X93–X95, Assault (homicide) by discharge of firearms; Y22–Y24, Discharge of firearms, undetermined intent; and Y35.0, Legal intervention involving firearm discharge. Deaths from injury by firearms exclude deaths due to explosives and other causes indirectly related to firearms.

Codes for drug-induced deaths

Causes of death attributable to drug-induced mortality include selected codes from the ICD–10 title Mental and behavioral disorders due to psychoactive substance use, specifically, ICD–10 codes F11.0–F11.5, F11.7–F11.9, F12.0–F12.5, F12.7–F12.9, F13.0–F13.5, F13.7–F13.9, F14.0–F14.5, F14.7–F14.9, F15.0–F15.5, F15.7–F15.9, F16.0–F16.5, F16.7–F16.9, F17.0, F17.3–F17.5, F17.7–F17.9, F18.0–F18.5, F18.7–F18.9, F19.0–F19.5, and F19.7–F19.9; Accidental poisoning by and exposure to drugs, medicaments and biological substances, X40–X44; Intentional self-poisoning (suicide) by and exposure to drugs, medicaments and biological substances, X60–X64; Assault (homicide) by drugs, medicaments and biological substances, X85; and Poisoning by and exposure to drugs, medicaments and biological substances, undetermined intent, Y10–Y14. Drug-induced causes exclude accidents, homicides, and other causes indirectly related to drug use. Also excluded are newborn deaths associated with mother's drug use.

Codes for alcohol-induced deaths

Causes of death attributable to alcohol-induced mortality include ICD–10 codes F10, Mental and behavioral disorders due to alcohol use; G31.2, Degeneration of nervous system due to alcohol; G62.1, Alcoholic polyneuropathy; I42.6, Alcoholic cardiomyopathy; K29.2, Alcoholic gastritis; K70, Alcoholic liver disease; R78.0, Finding of alcohol in blood; X45, Accidental poisoning by and exposure to alcohol; X65, Intentional self-poisoning by and exposure to alcohol; and Y15, Poisoning by and exposure to alcohol, undetermined intent. Alcohol-induced causes exclude accidents, homicides, and other causes indirectly related to alcohol use. This category also excludes newborn deaths associated with maternal alcohol use.

Marital status

Age-specific and age-adjusted death rates by marital status are shown in table 25 by sex. Mortality data by marital status is generally of high quality. A study of death certificate data using the 1986 National Mortality Followback Survey showed a high level of consistency in reporting marital status (47). Age-adjusted death rates by marital status were computed based on the age-specific rates and the standard population for ages 25 years and over. While age-specific death rates by marital status are shown for the age group 15–24 years, they are not included in the computation of the age-adjusted rate because of their high variability, particularly for the widowed population. Also, the age groups 75–84 and 85 years and over are combined due to high variability in death rates in the 85 year and over age group, particularly for the never married population.

In previous reports of final mortality data, population estimates from the CPS were used to calculate death rates for marital status by race. Beginning in 2002, CPS respondents were given the option of choosing more than one racial group to identify themselves. Because mortality data for 2002 is not nationally available for racial categories comparable to those used in the CPS, population estimates are not available to calculate death rates for marital status by race. Therefore, mortality data by marital status showing race and Hispanic origin detail are not shown in this report. However, the number of deaths for 2002 by marital status for previously shown race and Hispanic origin categories are available on the 2002 mortality data set (see NCHS Web site at http://www.cdc.gov/nchs/products/elec_prods/subject/mortucd.htm.)

Educational attainment

Beginning with the 1989 data year, an item indicating decedent's educational attainment was added to the certificates of numerous States. Mortality data on educational attainment for 2002 are based on deaths to residents of the 47 States and the District of Columbia whose data were approximately 80 percent or more complete on a place-of-occurrence basis. Data for Georgia, Rhode Island, and South Dakota were excluded because the item was not on their certificates.

Age-specific and age-adjusted death rates by educational attainment are shown in table 26. Age-adjusted death rates by educational attainment were computed based on the age-specific rates and the standard population for ages 25–64 years. Data for age groups 65 years and over are not shown because reporting quality is poorer at older than younger ages (56).

Rates by educational attainment are affected by differences in measurement of education for the numerator and the denominator. The numerator is based on number of years of education completed as reported on the death certificate whereas the denominator is based on highest degree completed as reported on census surveys (57).

Injury at work

Information on deaths attributed to injuries at work is derived from a separate item on the death certificate that asks the medical certifier whether the death resulted from an injury sustained at work. The item is on the death certificate of all States. Number of deaths, age-specific death rates, and age-adjusted death rates for injury at work are shown in tables 27 and 28. Deaths, crude death rates, and age-adjusted death rates for injury at work are shown for ages 15 years and over. Age-adjusted death rates for injury at work were computed using age-specific death rates and the U.S. standard population based on year 2000 standard for ages 15 years and over. See section on "Computing rates."

Infant mortality

Infant mortality rates are the most commonly used index for measuring the risk of dying during the first year of life. The rates

presented in this report are calculated by dividing the number of infant deaths in a calendar year by the number of live births registered for the same period and are presented as rates per 1,000 or per 100,000 live births. For final birth figures used in the denominator for infant mortality rates, see *Births: Final Data for 2002* (29). In contrast to infant mortality rates based on live births, infant death rates are based on the estimated population under 1 year of age. Infant death rates that appear in tabulations of age-specific death rates in this report are calculated by dividing the number of infant deaths by the July 1, 2002, population estimate of persons under 1 year of age, based on 2000 census populations. These rates are presented as rates per 100,000 population in this age group. Because of differences in the denominators, infant death rates may differ from infant mortality rates.

Maternal mortality

Maternal mortality rates are also computed on the basis of the number of live births. The maternal mortality rate indicates the likelihood of a pregnant woman dying of maternal causes. They are calculated by dividing the number of maternal deaths in a calendar year by the number of live births registered for the same period and are presented as rates per 100,000 live births. The number of live births used in the denominator is an approximation of the population of pregnant women who are at risk of a maternal death.

"Maternal deaths" are defined by the World Health Organization as "the death of a women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes" (7). Included in these deaths are ICD–10 codes A34, O00–O95, and O98–O99.

Some State death certificates include a separate question regarding pregnancy status. A positive response to the question is interpreted as if "pregnant" was reported in Part II of the cause-of-death section of the death certificate. If a specified length of time is not provided by the medical certifier, it is assumed that the pregnancy terminated 42 days or less prior to death. Further, if only indirect maternal causes of death (i.e., a previously existing disease or a disease that developed during pregnancy which was not due to direct obstetric causes but was aggravated by physiologic effects of pregnancy) are reported in Part I and pregnancy is reported in either Part I or Part II, the death is classified as a maternal death.

Quality of reporting and processing cause of death

One index of the quality of reporting causes of death is the proportion of death certificates coded to Chapter XVIII; Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (ICD–10 codes R00–R99). Although deaths occur for which the underlying causes are impossible to determine, this proportion indicates the care and consideration given to the cause-of-death statement by the medical certifier. This proportion also may be used as a rough measure of the specificity of the medical diagnoses made by the certifier in various areas. The percent of all reported deaths in the United States assigned to Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, was 1.23 percent in 2002, lower than in 2000 and 2001 (1.33 and 1.34 percent, respectively), but higher than the percent in 1999 (1.12 percent). From 1990 through 1999, the percent of deaths from this cause for all ages combined generally was fairly stable, between 1.08 and 1.18 percent.

Rules for coding a cause(s) of death may sometimes require modification when evidence suggests that such modifications will improve the quality of cause-of-death data. These changes, however, may affect comparability of data between years for select causes of death.

The large increase in Influenza (ICD–10 codes J10–J11) deaths from 2001 to 2002 is largely due to a change in the coding rules, which resulted in deaths that would have been assigned to Pneumonia in 2001, instead were assigned to Influenza in 2002.

Among the infant causes, the large increase in deaths from Newborn affected by maternal complications of pregnancy (maternal complications) (ICD–10 code P01) and the decrease in deaths from Atelectasis (ICD codes P28.0–P28.1) are partly due to a change in the coding rules, which resulted in deaths that would have previously been assigned to Atelectasis, instead were assigned to maternal complications in 2002.

Similarly, the large increase in Birth trauma (ICD–10 codes P10–P15) among infants for 2002, is largely due to a coding rule change, which resulted in deaths that would have previously been assigned to Neonatal aspiration syndromes (ICD–10 code P24), Pulmonary hemorrhage originating in the perinatal period (ICD–10 code P26), Neonatal hemorrhage (ICD–10 codes P50–P52,P54), or Other perinatal conditions (ICD–10 codes P29,P70.3–P70.99,P71–P76, P78–P81,P83.0–P83.1,P83.3–P93.9,P90–P96) instead were assigned Birth trauma in 2002.

Changes to the coding rules, such as those described above, are implemented when evidence suggests that the changes will improve the overall quality of the cause of death data. Such changes, however, may affect comparability of data for select causes of death between years.

Rare causes of death

Selected causes of death considered to be of public health concern are routinely confirmed by the States according to agreed upon procedures between the State vital statistics programs and the National Center for Health Statistics. These causes, termed "Infrequent and rare causes of death," are listed in the NCHS instruction manuals Parts 2a, 11, and 20 (37,58,59).

For data year 2002, complete confirmation of deaths from infrequent and rare causes was not provided by the District of Columbia and the following States: Alabama, California, Illinois, Minnesota, Mississippi, Nebraska, New York, Pennsylvania, Texas, and West Virginia.

Population bases for computing rates

Populations used for computing death rates and life tables shown in this report represent the population residing in the United States, enumerated as of April 1 for census years and estimated as of July 1 for all other years. Population estimates used to compute death rates for the United States for 2002 are shown by race for 10-year age groups in table I and are available by 5-year age groups on the mortality Web site at http://www.cdc.gov/nchs/datawh/statab/unpubd/mortabs.htm (60).

Population estimates in table II for Mexicans, Puerto Ricans, Cubans, and Other Hispanics, and population estimates by marital status in table III, are based on the Current Population Survey adjusted to resident population control totals for the United States (61) and, as such, are subject to sampling variation (see "Random variation"). The control totals used are 2000-based population estimates for the United States for July 1, 2002 (60).

Population estimates by educational attainment, shown in table IV, are also based on the Current Population Survey (61) adjusted to resident population control totals (61), and are also subject to sampling variation (see "Random variation"). The control totals used are 2000-based population estimates for 47 States and the District of Columbia for July 1, 2002 (60).

Population estimates for each State, shown in table V, were estimated from State-level postcensal population estimates based on the 2000 census, estimated as of July 1, 2002 (60). Population estimates for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas, also shown in table V, are based on the 2000 census, estimated as of July 1, 2002 (62). Population estimates for each State and territory are based on demographic analysis and, therefore, are not subject to sampling variation.

Death rates, shown in this report, for 1991–2002 are based on populations that are consistent with the 2000 census levels (60,63–73). These estimates were produced under a collaborative arrangement with the U.S. Census Bureau and are based on the 2000 census counts by age, race, and sex, modified to be consistent with U.S. Office of Management and Budget racial categories as of 1977 and historical categories for death data (9). The modification procedures are described in detail elsewhere (11,12).

Computing rates

Except for infant and maternal mortality rates, rates are on an annual basis per 100,000 estimated population residing in the specified area. Infant and maternal mortality rates are per 1,000 or per 100,000 live births. Comparisons made in the text among rates, unless otherwise specified, are statistically significant at the 0.05 level of significance. Lack of comment in the text about any two rates does not mean that the difference was tested and found not to be significant at this level.

Age-adjusted rates (R') are used to compare relative mortality risks among groups and over time. However, they should be viewed as relative indexes rather than as actual measures of mortality risk. They were computed by the direct method, that is, by applying age-specific death rates (R_i) to the U.S. standard population (w_i) (table VII).

$$R' = \sum_i w_i R_i$$

Beginning with the 1999 data year, a new population standard was adopted by NCHS for use in age-adjusting death rates. Based on the projected year 2000 population of the United States, the new standard replaces the 1940 standard population that had been used for over 50 years. The new population standard affects levels of mortality and to some extent trends and group comparisons. Of particular note are the effects on race comparison of mortality. For detailed discussion see *Age Standardization of Death Rates: Implementation of the Year 2000 Standard* (74).

All age-adjusted rates shown in this report are based on the year 2000 standard population. The year 2000 standard population and corresponding weights used for computing age-adjusted rates and standard errors, excluding those by marital status, education, injury at work, and the U.S. territories, are shown in table VI.

Age-adjusted rates by marital status were computed by applying the age-specific death rates to the U.S. standard population for ages 25 years and over. Although age-specific death rates by marital status are shown for the age group 15–24 years, they are not included in the calculation of age-adjusted rates because of their high variability, particularly for the widowed population. Also, the age groups 75–84 and 85 years and over are combined because of high variability in death rates in the 85 years and over age group, particularly for the never married population. The year 2000 standard population and corresponding weights used for computing age-adjusted rates and standard errors by marital status are shown in table VII.

Age-adjusted rates by educational attainment were computed by applying the age-specific death rates to the U.S. standard population for ages 25–64 years. Data for age groups 65 years and over are not shown because reporting quality is poorer for older than for younger ages (56). The year 2000 standard population and corresponding weights used for computing age-adjusted rates and standard errors by education are shown in table VIII.

Age-adjusted rates for injury at work were computed by applying the age-specific death rates to the U.S. standard population for ages 15 years and over. The year 2000 standard population and corresponding weights used for computing age-adjusted rates and standard errors for injury at work are shown in table IX.

Age-adjusted rates for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas were computed by applying the age-specific death rates to the U.S. standard population. Age groups for 75 years and over were combined because population counts were unavailable by age group for ages over 75 years. The year 2000 standard population and corresponding weights used for computing age-adjusted rates and standard errors for the territories are shown in table X.

Using the same standard population, death rates for the total population and for each race-sex group were adjusted separately. The age-adjusted rates were based on 10-year age groups. It is important not to compare age-adjusted death rates with crude rates.

Death rates for the Hispanic population are based only on events to persons reported as Hispanic. Rates for non-Hispanic white persons are based on the sum of all events to white decedents reported as non-Hispanic and white decedents with origin not stated. Hispanic origin is not imputed if it is not reported.

Random variation

The mortality data presented in this report, with the exception of data for 1972, are not subject to sampling error. In 1972 mortality data were based on a 50-percent sample of deaths because of resource constraints. Mortality data, even based on complete counts, may be affected by random variation. That is, the number of deaths that actually occurred may be considered as one of a large series of possible results that could have arisen under the same circumstances (75,76). When the number of deaths is small (perhaps less than 100), random variation tends to be relatively large. Therefore, considerable caution must be observed in interpreting statistics based on small numbers of deaths.

Table I. Estimated population by 10-year age groups, specified race and sex: United States, 2002

[Populations are postcensal estimates based on the 2000 census, estimated as of July 1, 2002; see "Technical Notes"]

Age	All races			White			Black			American Indian			Asian or Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	288,368,706	141,660,980	146,707,726	234,746,440	115,966,453	118,779,987	37,747,692	17,978,612	19,769,080	3,076,095	1,535,463	1,540,632	12,798,479	6,180,452	6,618,027
Under 1 year	4,033,719	2,063,824	1,969,895	3,130,730	1,602,846	1,527,884	674,576	344,210	330,366	41,724	21,297	20,427	186,689	95,471	91,218
1–4 years	15,575,428	7,961,545	7,613,883	12,126,969	6,212,014	5,914,955	2,539,378	1,290,224	1,249,154	199,139	101,419	97,720	709,942	357,888	352,054
5–14 years	41,037,286	21,012,559	20,024,727	31,882,530	16,363,202	15,519,328	6,804,811	3,454,210	3,350,601	582,617	295,331	287,286	1,767,328	899,816	867,512
15–24 years	40,589,783	20,821,269	19,768,514	31,952,941	16,481,823	15,471,118	6,198,224	3,107,006	3,091,218	557,286	286,617	270,669	1,881,332	945,823	935,509
25–34 years	39,928,304	20,202,776	19,725,528	31,626,394	16,214,420	15,411,974	5,444,534	2,589,128	2,855,406	459,579	236,699	222,880	2,397,797	1,162,529	1,235,268
35–44 years	44,916,606	22,366,506	22,550,100	36,482,845	18,367,816	18,115,029	5,805,202	2,725,753	3,079,449	470,480	232,958	237,522	2,158,079	1,039,979	1,118,100
45–54 years	40,083,937	19,676,321	20,407,616	33,347,010	16,552,991	16,794,019	4,651,519	2,148,656	2,502,863	373,524	181,328	192,196	1,711,884	793,346	918,538
55–64 years	26,601,726	12,784,311	13,817,415	22,761,178	11,045,418	11,715,760	2,640,870	1,176,912	1,463,958	210,022	101,396	108,626	989,656	460,585	529,071
65–74 years	18,274,215	8,301,005	9,973,210	15,878,159	7,288,211	8,589,948	1,687,536	700,654	986,882	110,349	50,750	59,599	598,171	261,390	336,781
75–84 years	12,734,633	5,081,056	7,653,577	11,405,718	4,580,254	6,825,464	964,301	348,584	615,717	53,892	22,071	31,821	310,722	130,147	180,575
85 years and over	4,593,069	1,389,808	3,203,261	4,151,966	1,257,458	2,894,508	336,741	93,275	243,466	17,483	5,597	11,886	86,879	33,478	53,401

SOURCE: National Center for Health Statistics. Estimates of the July 1, 2002, United States resident population by age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. 2003.

Table II. Estimated population by 10-year age groups, according to specified Hispanic origin, race for non-Hispanic population, and sex: United States, 2002

[Populations for all origins, Hispanic, non-Hispanic, non-Hispanic white, and non-Hispanic black are postcensal estimates based on the 2000 census, estimated as of July 1, 2002; populations for Mexican, Puerto Rican, Cuban, Central and South American, and other and unknown Hispanic are based on the Current Population Survey adjusted to resident population control totals. Due to rounding, population estimates for Hispanic subgroups may not add to Hispanic control totals. The control totals are 2000-based population estimates for the United States for July 1, 2002; see "Technical Notes"]

Hispanic origin, race for non-Hispanic population, and sex	Total	Under 1 year	1–4 years	5–14 years	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65–74 years	75–84 years	85 years and over
All origins	288,368,706	4,033,719	15,575,428	41,037,286	40,589,783	39,928,304	44,916,606	40,083,937	26,601,726	18,274,215	12,734,633	4,593,069
Male	141,660,980	2,063,824	7,961,545	21,012,559	20,821,269	20,202,776	22,366,506	19,676,321	12,784,311	8,301,005	5,081,056	1,389,808
Female	146,707,726	1,969,895	7,613,883	20,024,727	19,768,514	19,725,528	22,550,100	20,407,616	13,817,415	9,973,210	7,653,577	3,203,261
Hispanic	38,761,304	833,933	3,127,779	7,265,037	6,803,673	7,332,062	5,808,458	3,654,900	1,974,793	1,180,765	599,503	180,401
Male	19,991,226	426,383	1,598,115	3,720,534	3,656,424	3,978,236	3,026,851	1,823,307	934,703	523,210	243,698	59,765
Female	18,770,078	407,550	1,529,664	3,544,503	3,147,249	3,353,826	2,781,607	1,831,593	1,040,090	657,555	355,805	120,636
Mexican	25,927,404	626,480	2,333,129	5,196,998	4,675,081	5,055,197	3,671,884	2,195,530	1,139,357	606,777	335,029	91,942
Male	13,595,601	320,431	1,187,108	2,671,545	2,528,177	2,792,967	1,978,640	1,126,860	547,035	272,975	136,976	32,887
Female	12,331,803	306,049	1,146,021	2,525,453	2,146,904	2,262,230	1,693,244	1,068,670	592,322	333,802	198,053	59,055
Puerto Rican	3,491,092	54,884	228,629	655,707	591,058	588,858	526,691	386,929	244,563	140,477	51,311	21,985
Male	1,670,447	31,112	110,281	318,063	290,992	283,073	254,243	191,056	108,655	55,217	20,836	6,919
Female	1,820,645	23,772	118,348	337,644	300,066	305,785	272,448	195,873	135,908	85,260	30,475	15,066
Cuban	1,418,217	15,101	58,361	160,457	135,276	163,194	223,517	162,043	175,553	184,552	95,097	45,066
Male	716,249	4,966	31,394	88,965	66,267	94,884	119,749	82,000	76,222	90,017	48,122	13,663
Female	701,968	10,135	26,967	71,492	69,009	68,310	103,768	80,043	99,331	94,535	46,975	31,403
Other Hispanic[1]	7,924,566	137,465	507,655	1,251,860	1,402,267	1,524,808	1,386,360	910,415	415,320	248,950	118,059	21,407
Male	4,008,924	69,874	269,331	641,950	770,990	807,310	674,217	423,397	202,797	105,000	37,763	6,295
Female	3,915,642	67,591	238,324	609,910	631,277	717,498	712,143	487,018	212,523	143,950	80,296	15,112
Non-Hispanic[2]	249,607,402	3,199,786	12,447,649	33,772,249	33,786,110	32,596,242	39,108,148	36,429,037	24,626,933	17,093,450	12,135,130	4,412,668
Male	121,669,754	1,637,441	6,363,430	17,292,025	17,164,845	16,224,540	19,339,655	17,853,014	11,849,608	7,777,795	4,837,358	1,330,043
Female	127,937,648	1,562,345	6,084,219	16,480,224	16,621,265	16,371,702	19,768,493	18,576,023	12,777,325	9,315,655	7,297,772	3,082,625
White	198,691,529	2,337,889	9,224,405	25,203,283	25,653,541	24,775,910	31,065,197	29,942,672	20,908,117	14,762,715	10,836,937	3,980,863
Male	97,328,705	1,197,524	4,728,800	12,940,754	13,086,150	12,480,105	15,533,926	14,851,443	10,167,732	6,793,121	4,348,361	1,200,789
Female	101,362,824	1,140,365	4,495,605	12,262,529	12,567,391	12,295,805	15,531,271	15,091,229	10,740,385	7,969,594	6,488,576	2,780,074
Black	36,145,193	647,046	2,402,138	6,460,168	5,908,296	5,160,980	5,576,646	4,502,817	2,566,235	1,645,906	944,343	330,618
Male	17,191,516	330,090	1,220,181	3,278,714	2,958,889	2,451,380	2,616,049	2,077,847	1,142,737	683,007	341,210	91,412
Female	18,953,677	316,956	1,181,957	3,181,454	2,949,407	2,709,600	2,960,597	2,424,970	1,423,498	962,899	603,133	239,206

[1]Includes Central and South American and Other and unknown Hispanic. [2]Includes races other than white and black.

SOURCE: Population estimates for specified Hispanic subgroups based on unpublished tabulations prepared by the Housing and Household Economic Statistics Division, U.S. Bureau of the Census. Population estimates for All origins, Hispanic, non-Hispanic, non-Hispanic white, and non-Hispanic black were prepared under a collaborative arrangement with the U.S. Census Bureau. See references 38 and 39.

Table III. Estimated population for ages 15 years and over by marital status, 10-year age groups and sex: United States, 2002

[Population estimates are based on the Current Population Survey adjusted to resident population controls for the United States. The control totals used are 2000-based population estimates for the United States for July 1, 2002]

Marital status and sex	15 years and over	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65–74 years	75 years and over
All races	227,722,307	40,589,801	39,928,326	44,916,605	40,083,935	26,601,727	18,274,194	17,327,719
Never married	65,111,176	36,093,615	14,917,115	7,243,514	3,958,949	1,563,688	679,491	654,804
Ever married	162,611,131	4,496,186	25,011,211	37,673,091	36,124,986	25,038,039	17,594,703	16,672,915
Married	126,059,273	4,169,757	22,373,373	31,681,531	28,820,504	19,250,842	12,083,731	7,679,535
Widowed	15,059,404	24,414	131,501	416,480	877,014	1,756,998	3,731,162	8,121,835
Divorced	21,492,454	302,015	2,506,337	5,575,080	6,427,468	4,030,199	1,779,810	871,545
All races, male	110,623,049	20,821,277	20,202,767	22,366,497	19,676,327	12,784,310	8,301,001	6,470,870
Never married	35,758,400	19,170,912	8,767,017	4,278,950	2,151,792	812,631	331,952	245,146
Ever married	74,864,649	1,650,365	11,435,750	18,087,547	17,524,535	11,971,679	7,969,049	6,225,724
Married	63,103,053	1,540,578	10,376,309	15,563,401	14,490,807	10,054,727	6,552,571	4,524,660
Widowed	2,784,113	6,798	27,173	96,736	213,076	313,931	716,554	1,409,845
Divorced	8,977,483	102,989	1,032,268	2,427,410	2,820,652	1,603,021	699,924	291,219
All races, female	117,099,258	19,768,524	19,725,559	22,550,108	20,407,608	13,817,417	9,973,193	10,856,849
Never married	29,352,776	16,922,703	6,150,098	2,964,564	1,807,157	751,057	347,539	409,658
Ever married	87,746,482	2,845,821	13,575,461	19,585,544	18,600,451	13,066,360	9,625,654	10,447,191
Married	62,956,220	2,629,179	11,997,064	16,118,130	14,329,697	9,196,115	5,531,160	3,154,875
Widowed	12,275,291	17,616	104,328	319,744	663,938	1,443,067	3,014,608	6,711,990
Divorced	12,514,971	199,026	1,474,069	3,147,670	3,606,816	2,427,178	1,079,886	580,326

SOURCE: Population estimates based on unpublished tabulations prepared by the Housing and Household Economic Statistics Division of the U.S. Census Bureau. 2004.

Table IV. Estimated population for ages 25–64, by educational attainment and sex: Total of 47 reporting States and the District of Columbia, 2002

[Population estimates based on the Current Population Survey adjusted to resident population controls. The control totals used are 2000-based population estimates for 47 States and the District of Columbia for July 1, 2002; See "Technical Notes"]

Years of school completed and sex	25–64 years	25–34 years	35–44 years	45–54 years	55–64 years
Both sexes	146,001,025	38,386,262	43,273,768	38,639,761	25,701,234
Under 12 years	18,404,570	5,051,876	5,070,361	4,206,984	4,075,349
12 years	45,482,180	10,941,865	13,839,694	12,012,445	8,688,176
13 or more years	82,114,275	22,392,521	24,363,713	22,420,332	12,937,709
Male	72,329,977	19,444,253	21,569,749	18,950,018	12,365,957
Under 12 years	9,752,298	2,878,815	2,759,619	2,134,825	1,979,039
12 years	22,337,544	5,840,072	7,085,115	5,703,585	3,708,772
13 or more years	40,240,135	10,725,366	11,725,015	11,111,608	6,678,146
Female	73,671,048	18,942,009	21,704,019	19,689,743	13,335,277
Under 12 years	8,652,272	2,173,061	2,310,742	2,072,159	2,096,310
12 years	23,144,636	5,101,793	6,754,579	6,308,860	4,979,404
13 or more years	41,874,140	11,667,155	12,638,698	11,308,724	6,259,563

SOURCE: Population estimates based on unpublished tabulations prepared by the Housing and Household Economic Statistics Division, U.S. Bureau of the Census. 2003.

Measuring random variability—To quantify the random variation associated with mortality statistics, one must make an assumption regarding the appropriate underlying distribution. Deaths, as infrequent events, can be viewed as deriving from a Poisson probability distribution. The Poisson distribution is simple conceptually and computationally, and provides reasonable, conservative variance estimates for mortality statistics when the probability of dying is relatively low (76). Using the properties of the Poisson distribution, the standard error (SE) associated with the number of deaths (D) is

$$1. \quad SE(D) = \sqrt{\text{var}(D)} = \sqrt{D}$$

where var(D) denotes the variance of D.

The standard error associated with crude and age-specific death rates (R) assumes that the population denominator (P) is a constant and is

$$2. \quad SE(R) = \sqrt{\text{var}\left(\frac{D}{P}\right)} = \sqrt{\frac{1}{P^2}\text{var}(D)} = \sqrt{\frac{D}{P^2}} = \frac{R}{\sqrt{D}}$$

The coefficient of variation or relative standard error (RSE) is a useful measure of relative variation. The RSE is calculated by dividing the statistic (e.g., number of deaths, death rate) into its standard error and multiplying by 100. For the number of deaths

$$RSE(D) = 100\,\frac{SE(D)}{D} = 100\,\frac{\sqrt{D}}{D} = 100\sqrt{\frac{1}{D}}$$

Table V. Estimated population for the United States, each State, Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas, 2002

[Populations for the United States are postcensal estimates produced in 2002 based on the 2000 census estimated as of July 1, 2002. Populations for each State, Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas are postcensal estimates produced in 2003 based on the 2000 census estimated as of July 1, 2002. State populations do not add to U.S. total]

Area	Total	Area	Total
United States	288,368,706	Nevada	2,173,491
		New Hampshire	1,275,056
Alabama	4,486,508	New Jersey	8,590,303
Alaska	643,786	New Mexico	1,855,059
Arizona	5,456,453	New York	19,157,532
Arkansas	2,710,079	North Carolina	8,320,146
California	35,116,033	North Dakota	634,110
Colorado	4,506,542	Ohio	11,421,268
Connecticut	3,460,503	Oklahoma	3,493,714
Delaware	807,385	Oregon	3,521,515
District of Columbia	570,898	Pennsylvania	12,335,091
Florida	16,713,149	Rhode Island	1,069,725
Georgia	8,560,310	South Carolina	4,107,183
Hawaii	1,244,898	South Dakota	761,063
Idaho	1,341,131	Tennessee	5,797,289
Illinois	12,600,620	Texas	21,779,893
Indiana	6,159,068	Utah	2,316,256
Iowa	2,936,760	Vermont	616,592
Kansas	2,715,884	Virginia	7,293,542
Kentucky	4,092,891	Washington	6,068,996
Louisiana	4,482,646	West Virginia	1,801,873
Maine	1,294,466	Wisconsin	5,441,196
Maryland	5,458,137	Wyoming	498,703
Massachusetts	6,427,803		
Michigan	10,050,446		
Minnesota	5,019,720	Puerto Rico	3,858,806
Mississippi	2,871,782	Virgin Islands	108,810
Missouri	5,672,579	Guam	161,057
Montana	909,453	American Samoa	57,716
Nebraska	1,729,180	Northern Marianas	74,003

SOURCE: U.S. Census Bureau. See references 38 and 40.

Table VI. United States standard population: Numbers and proportions (weights)

Age	Number	Weights (w_i)
All ages	1,000,000	1.000000
Under 1 year	13,818	0.013818
1–4 years	55,317	0.055317
5–14 years	145,565	0.145565
15–24 years	138,646	0.138646
25–34 years	135,573	0.135573
35–44 years	162,613	0.162613
45–54 years	134,834	0.134834
55–64 years	87,247	0.087247
65–74 years	66,037	0.066037
75–84 years	44,842	0.044842
85 years and over	15,508	0.015508

Table VII. United States standard population for ages 25 years and over: Numbers and proportions (weights)

Age	Number	Weights (w_i)
25 years and over	646,654	1.000000
25–34 years	135,573	0.209653
35–44 years	162,613	0.251468
45–54 years	134,834	0.208510
55–64 years	87,247	0.134921
65–74 years	66,037	0.102121
75 years and over	60,350	0.093327

Table VIII. United States standard population for ages 25–64 years: Numbers and proportions (weights)

Age	Number	Weights (w_i)
25–64 years	520,267	1.000000
25–34 years	135,573	0.260584
35–44 years	162,613	0.312557
45–54 years	134,834	0.259163
55–64 years	87,247	0.167697

Table IX. United States standard population for ages 15 years and over: Numbers and proportions (weights)

Age	Number	Weights (w_i)
15 years and over	785,300	1.000000
15–24 years	138,646	0.176552
25–34 years	135,573	0.172638
35–44 years	162,613	0.207071
45–54 years	134,834	0.171697
55–64 years	87,247	0.111100
65 years and over	126,387	0.160941

Table X. United States standard population: Numbers and proportions (weights)

Age	Number	Weights (w_i)
All ages	1,000,000	1.000000
Under 1 year	13,818	0.013818
1–4 years	55,317	0.055317
5–14 years	145,565	0.145565
15–24 years	138,646	0.138646
25–34 years	135,573	0.135573
35–44 years	162,613	0.162613
45–54 years	134,834	0.134834
55–64 years	87,247	0.087247
65–74 years	66,037	0.066037
75 years and over	60,350	0.060350

For crude and age-specific death rates

$$\mathrm{RSE}(R) = 100\,\frac{\mathrm{SE}(R)}{R} = 100\,\frac{R/\sqrt{D}}{R} = 100\sqrt{\frac{1}{D}}$$

Thus,

3. $$\mathrm{RSE}(D) = \mathrm{RSE}(R) = 100\sqrt{\frac{1}{D}}$$

The standard error of the age-adjusted death rate (R') is

4. $$\mathrm{SE}(R') = \sqrt{\sum_i w_i^2\,\mathrm{var}\,(R_i)} = \sqrt{\sum_i \left\{w_i^2\left(\frac{R_i^2}{D_i}\right)\right\}}$$

where

R_i = age-specific rate for the ith age group
w_i = age-specific standard weight for the ith age group from the U.S. standard population such that $\sum w_i = 1.0$ (see table VI and age-adjusted death rate under "Definition of terms")
D_i = number of deaths for the ith age group

The RSE for the age-adjusted rate, RSE(R'), can easily be calculated by dividing SE(R') from formula 4 by the age-adjusted death rate, R', and multiplying by 100.

$$\mathrm{RSE}(R') = 100\,\frac{\mathrm{SE}(R')}{R'}$$

For tables showing infant and maternal mortality rates based on live births (B) in the denominator, calculation of the standard error assumes random variability in both the numerator and denominator. The standard error for the infant mortality rate (IMR) is

5. $$\mathrm{SE}(IMR) = \sqrt{\frac{\mathrm{var}(D) + IMR \bullet \mathrm{var}(B)}{E(B)^2}} = \sqrt{\frac{D}{B^2} + \frac{D^2}{B^3}}$$

where the number of births, B, is also assumed to be distributed according to a Poisson distribution and $E(B)$ is the expectation of B.

The RSE for the IMR is

6. $$\mathrm{RSE}(IMR) = 100\,\frac{\mathrm{SE}(IMR)}{IMR} = 100\sqrt{\frac{1}{D} + \frac{1}{B}}$$

For maternal mortality rates, formulas 5 and 6 may be used substituting the maternal mortality rate for the IMR.

Formulas 1–6 may be used for all tables presented in this report except for death rates and age-adjusted death rates shown in tables 5, 25, and 26 that are calculated using population figures that are subject to sampling error (see the following subsection).

Tables 5, 25, and 26—Death rates for Mexicans, Puerto Ricans, Cubans, and Other Hispanics in table 5, rates by marital status in table 25 and rates by educational attainment in table 26 are based on population estimates derived from the U.S. Bureau of the Census' Current Population Survey (CPS) for 2002 and adjusted to resident population control totals. As a result, the rates are subject to sampling variability in the denominator as well as random variability in the numerator.

For crude and age-specific death rates (R) the standard error is calculated as

7. $$\mathrm{SE}(R) = R\sqrt{\frac{1}{D} + 0.67\left(a + \frac{b}{P}\right)}$$

For age-adjusted death rates (R')

8. $$\mathrm{SE}(R') = \sqrt{\sum_i \left\{w_i^2 R_i^2\left[\frac{1}{D_i} + 0.67\left(a + \frac{b}{P_i}\right)\right]\right\}}$$

where a and b in formulas 7 and 8 represent parameters presented in table XI, which are derived from the CPS data for 2001 and 2002 and vary depending on the subgroup of interest (77,78).

Suppression of unreliable rates—Beginning with 1989 data, an asterisk is shown in place of a crude or age-specific death rate based on fewer than 20 deaths, the equivalent of an RSE of 23 percent or more. The limit of 20 deaths is a convenient, if somewhat arbitrary, benchmark, below which rates are considered to be too statistically unreliable for presentation. For infant and maternal mortality rates, the same criterion (less than 20 deaths) is used to determine whether an asterisk is presented in place of the rate. For age-adjusted death rates the suppression criterion is based on the sum of the age-specific deaths; i.e., if the sum of the age-specific deaths is less than 20, an asterisk is presented in place of the rate. These procedures are used throughout this report except for death rates shown in tables 5, 25, and 26.

For death rates shown in tables 5, 25, and 26, sampling variability in the population denominator has a substantial impact on the overall variability in the rate. Therefore, the number of deaths in the numerator is not used as the sole suppression factor. RSEs for rates shown in tables 5, 25, and 26 are derived from formulas 7 and 8 by dividing the results of formulas 7 and 8, by the crude/age-specific rate and age-adjusted rate, respectively, and multiplying by 100. Rates are replaced by asterisks if the calculated RSE is 23 percent or more. In some cases, for smaller population subgroups, the estimated sample population from the CPS may be zero, even though deaths are presented for these same subgroups. In these cases, the death rate is incalculable and is automatically replaced with an asterisk.

Confidence intervals and statistical tests based on 100 deaths or more—When the number of deaths is large, a normal approximation may be used in the calculation of confidence intervals and statistical tests. How large is to some extent a subjective judgment. In general, for crude and age-specific death rates and for infant and maternal mortality rates, the normal approximation performs quite well when the

Table XI. CPS standard error parameters for death rates in tables 5, 25, and 26

Characteristic	Total		White, black, non-Hispanic white, or non-Hispanic black		Hispanic	
	a	b	a	b	a	b
Table 5						
All origins	0.000000	0	0.000000	0	0.000000	0
Hispanic subgroups (Mexican, Puerto Rican, Cuban, and Other Hispanic)	. . .	. . .	. . .	. . .	–0.000100	3,809
Table 25						
All marital status groups combined	0.000000	0	. . .	. . .	. . .	. . .
Marital status subgroups (Never married, Ever married, Married, Widowed, Divorced)	–0.000009	2,652	. . .	. . .	. . .	. . .
Table 26						
All education groups	0.000000	0	. . .	. . .	. . .	. . .
Education subgroups (Under 12 years, 12 years, 13 years or over)	–0.000005	1,206	. . .	. . .	. . .	. . .

. . . Category not applicable.

number of deaths is 100 or greater. For age-adjusted rates, the criterion for use of the normal approximation is somewhat more complicated (6,74,79). Formula 9 is used to calculate 95-percent confidence limits for the death rate when the normal approximation is appropriate.

9. $L(R) = R - 1.96(\mathrm{SE}(R))$ and $U(R) = R + 1.96(\mathrm{SE}(R))$

where $L(R)$ and $U(R)$ are the lower and upper limits of the confidence interval, respectively. The resulting 95-percent confidence interval can be interpreted to mean that the chances are 95 in 100 that the "true" death rate falls between $L(R)$ and $U(R)$. For example, suppose that the crude death rate for Malignant neoplasms is 193.2 per 100,000 population based on 557,271 deaths. Lower and upper 95-percent confidence limits using formula 9 are calculated as

$L(193.2) = 193.2 - 1.96(.26) = 192.7$
$U(193.2) = 193.2 + 1.96(.26) = 193.7$

Thus, the chances are 95 in 100 that the true death rate for malignant neoplasms is between 192.7 and 193.7. Formula 9 can also be used to calculate 95-percent confidence intervals for the number of deaths, age-adjusted death rates, infant mortality rates, and other mortality statistics when the normal approximation is appropriate by replacing R with D, R', IMR, etc.

When testing the difference between two rates, R_1 and R_2 (each based on 100 or more deaths), the normal approximation may be used to calculate a test statistic, z, such that

10. $$z = \frac{R_1 - R_2}{\sqrt{\mathrm{SE}(R_1)^2 + \mathrm{SE}(R_2)^2}}$$

If $|z| \geq 1.96$ then the difference between the rates is statistically significant at the 0.05-level. If $|z| < 1.96$ then the difference is not statistically significant. Formula 10 can also be used to perform tests for other mortality statistics when the normal approximation is appropriate (when both statistics being compared meet the normal criteria) by replacing R_1 and R_2 with D_1 and D_2, R'_1 and R'_2, etc. Suppose that the female age-adjusted death rate for Malignant neoplasms of trachea, bronchus, and lung (lung cancer) is 41.0 per 100,000 U.S. standard population in 2001 (R_1) and 41.6 per 100,000 U.S. standard population in 2002 (R_2). The standard error for each of these figures, $\mathrm{SE}(R_1)$ and $\mathrm{SE}(R_2)$, is calculated using formula 4. Using formula 10, one can test if the increase in the age-adjusted rate is statistically significant.

$$z = \frac{41.0 - 41.6}{\sqrt{(0.163)^2 + (0.161)^2}} = -2.62$$

Because $|z| = 2.62 > 1.96$, the increase from 2001 to 2002 in the female age-adjusted death rate for lung cancer is statistically significant.

Confidence intervals and statistical tests based on less than 100 deaths—When the number of deaths is not large (less than 100), the Poisson distribution cannot be approximated by the normal distribution. The normal distribution is a symmetric distribution with a range from from $-\infty$ to $+\infty$. As a result, confidence intervals based on the normal distribution also have this range. The number of deaths or the death rate, however, cannot be less than zero. When the number of deaths is very small, approximating confidence intervals for deaths and death rates using the normal distribution will sometimes produce lower confidence limits that are negative. The Poisson distribution, in contrast, is an asymmetric distribution with zero as a lower bound. Thus, confidence limits based on this distribution will never be less than zero. A simple method based on the more general family of gamma distributions, of which the Poisson is a member, can be used to approximate confidence intervals for deaths and death rates when the number of deaths is small (74,79). For more information regarding how the gamma method is derived, see *Derivation of the gamma method* at the end of this section.

Calculations using the gamma method can be made using commonly available spreadsheet programs or statistical software (e.g., Excel, SAS) that include an inverse gamma function. In Excel, the function "gammainv(probability, alpha, beta)" returns values associated with the inverse gamma function for a given probability between 0 and 1. For 95 percent confidence limits, the probability associated with the lower limit is .05/2=.025 and the probability associated with the upper limit is 1-(.05/2)=.975. Alpha and beta are parameters associated with the gamma distribution. For the number of deaths and crude and

age-specific death rates, alpha=D (the number of deaths) and beta=1. In Excel, the following formulas can be used to calculate lower and upper 95 percent confidence limits for the number of deaths and crude and age-specific death rates

$L(D)$ = GAMMAINV(.025, D, 1) and $U(D)$ = GAMMAINV(.975, $D+1$, 1)

Confidence limits for the death rate are then calculated by dividing $L(D)$ and $U(D)$ by the population (P) at risk of dying (see formula 17).

Alternatively, 95 percent confidence limits can be estimated using the lower and upper confidence limit factors shown in table XII. For the number of deaths, D, and the death rate, R,

11. $L(D) = L \times D$ and $U(D) = U \times D$

12. $L(R) = L \times R$ and $U(R) = U \times R$

where L and U in formulas 11 and 12 are the lower and upper confidence limit factors which correspond to the appropriate number of deaths, D, in table XII. For example, suppose that the death rate for American Indian females aged 10–14 is 22.5 per 100,000 and based on 34 deaths. Applying formula 12, values for L and U from

Table XII. Lower and upper 95-percent confidence limit factors for the number of deaths and death rate when the number of deaths is less than 100

Number of deaths (D)	Lower confidence limit (L)	Upper confidence limit (U)	Number of deaths (D)	Lower confidence limit (L)	Upper confidence limit (U)
1	0.025318	5.571643	51	0.744566	1.314815
2	0.121105	3.612344	52	0.746848	1.311367
3	0.206224	2.922424	53	0.749069	1.308025
4	0.272466	2.560397	54	0.751231	1.304783
5	0.324697	2.333666	55	0.753337	1.301637
6	0.366982	2.176579	56	0.755389	1.298583
7	0.402052	2.060382	57	0.757390	1.295616
8	0.431729	1.970399	58	0.759342	1.292732
9	0.457264	1.898311	59	0.761246	1.289927
10	0.479539	1.839036	60	0.763105	1.287198
11	0.499196	1.789276	61	0.764921	1.284542
12	0.516715	1.746799	62	0.766694	1.281955
13	0.532458	1.710030	63	0.768427	1.279434
14	0.546709	1.677830	64	0.770122	1.276978
15	0.559692	1.649348	65	0.771779	1.274582
16	0.571586	1.623937	66	0.773400	1.272245
17	0.582537	1.601097	67	0.774986	1.269965
18	0.592663	1.580431	68	0.776539	1.267738
19	0.602065	1.561624	69	0.778060	1.265564
20	0.610826	1.544419	70	0.779549	1.263440
21	0.619016	1.528606	71	0.781008	1.261364
22	0.626695	1.514012	72	0.782438	1.259335
23	0.633914	1.500491	73	0.783840	1.257350
24	0.640719	1.487921	74	0.785215	1.255408
25	0.647147	1.476197	75	0.786563	1.253509
26	0.653233	1.465232	76	0.787886	1.251649
27	0.659006	1.454947	77	0.789184	1.249828
28	0.664493	1.445278	78	0.790459	1.248045
29	0.669716	1.436167	79	0.791709	1.246298
30	0.674696	1.427562	80	0.792938	1.244587
31	0.679451	1.419420	81	0.794144	1.242909
32	0.683999	1.411702	82	0.795330	1.241264
33	0.688354	1.404372	83	0.796494	1.239650
34	0.692529	1.397400	84	0.797639	1.238068
35	0.696537	1.390758	85	0.798764	1.236515
36	0.700388	1.384422	86	0.799871	1.234992
37	0.704092	1.378368	87	0.800959	1.233496
38	0.707660	1.372578	88	0.802029	1.232028
39	0.711098	1.367033	89	0.803082	1.230586
40	0.714415	1.361716	90	0.804118	1.229170
41	0.717617	1.356613	91	0.805138	1.227778
42	0.720712	1.351709	92	0.806141	1.226411
43	0.723705	1.346993	93	0.807129	1.225068
44	0.726602	1.342453	94	0.808102	1.223747
45	0.729407	1.338079	95	0.809060	1.222448
46	0.732126	1.333860	96	0.810003	1.221171
47	0.734762	1.329788	97	0.810933	1.219915
48	0.737321	1.325855	98	0.811848	1.218680
49	0.739806	1.322053	99	0.812751	1.217464
50	0.742219	1.318375			

table XII for 34 deaths are multiplied by the death rate, 22.5, such that

$L(R) = L(22.5) = 0.692529 \times 22.5 = 15.6$

$U(R) = U(22.5) = 1.397400 \times 22.5 = 31.4$

These confidence limits indicate that the chances are 95 out of 100 that the actual death rate for American Indian females aged 10–14 is between 15.6 and 31.4 per 100,000.

Although the calculations are similar, confidence intervals based on small numbers for age-adjusted death rates, infant and maternal mortality rates, and rates that are subject to sampling variability in the denominator are somewhat more complicated (6,74). Refer to the most recent version of the Mortality Technical Appendix for more details (http://www.cdc.gov/nchs/datawh/statab/pubd/ta.htm).

When comparing the difference between two rates, R_1 and R_2, where one or both of the rates are based on fewer than 100 deaths, a comparison of 95-percent confidence intervals may be used as a statistical test. If the 95-percent confidence intervals do not overlap, then the difference can be said to be statistically significant at the 0.05-level. A simple rule of thumb is: if $R_1 > R_2$ then test if $L(R_1) > U(R_2)$ or if $R_2 > R_1$ then test if $L(R_2) > U(R_1)$. Positive tests denote statistical significance at the 0.05-level. For example, suppose that American Indian females aged 10–14 have a death rate (R_1) of 22.5 based on 34 deaths and Asian and Pacific Islander (API) females aged 10–14 have a death rate (R_2) of 11.3 per 100,000 based on 49 deaths. The 95-percent confidence limits for R_1 and R_2 calculated using formula 12 would be

$L(R_{1)} = L(22.5) = 0.692529 \times 22.5 = 15.6$

$U(R_1) = U(22.5) = 1.397400 \times 22.5 = 31.4$

$L(R_2) = L(11.3) = 0.739806 \times 11.3 = 8.4$

$U(R_2) = U(11.3) = 1.322053 \times 11.3 = 14.9$

Because $R_1 > R_2$ and $L(R_1) > U(R_2)$, it can be concluded that the difference between the death rates for American Indian females 10–14 and API females of the same age is statistically significant at the 0.05-level. That is, taking into account random variability, API females 10–14 have a death rate that is significantly lower than that for American Indian females of the same age.

This test may also be used to perform tests for other statistics when the normal approximation is not appropriate for one or both of the statistics being compared by replacing R_1 and R_2 with D_1 and D_2, R'_1 and R'_2, etc.

Users of the method of comparing confidence intervals should be aware that this method is a conservative test for statistical significance. That is, the difference between two rates may, in fact, be statistically significant even though confidence intervals for the two rates overlap (80). Thus, caution should be observed when interpreting a non-significant difference between two rates, especially when the lower and upper limits being compared overlap only slightly.

Derivation of the gamma method—For a random variable X that follows a gamma distribution $\Gamma(y,z)$, where y and z are the parameters that determine the shape of the distribution, $E(X) = yz$ and $Var(X) = yz^2$ (81). For the number of deaths, D, $E(D) = D$ and $Var(D) = D$. It follows that $y = D$ and $z = 1$ and thus,

$$13. \quad D \sim \Gamma(D,1)$$

From equation 13, it is clear that the shape of the distribution of deaths depends only on the number of deaths.

For the death rate, R, $E(R) = R$ and $Var(R) = D/P^2$. It follows, in this case, that $y = D$ and $z = P^{-1}$ and thus,

$$14. \quad R \sim \Gamma(D,P^{-1}).$$

A useful property of the gamma distribution is that for $X \sim \Gamma(y,z)$, one can divide X by z such that $X/z \sim \Gamma(y,1)$. This converts the gamma distribution into a simplified, standard form dependent only on parameter y. Expressing equation 14 in its simplified form gives

$$15. \quad \frac{R}{P^{-1}} = D \sim \Gamma(D,1)$$

From equation 15, it is clear that the shape of the distribution of the death rate is also dependent solely on the number of deaths.

Using the results of equations 13 and 15, one can use the inverse gamma distribution to calculate upper and lower confidence limits. Lower and upper $100(1-\alpha)$ percent confidence limits for the number of deaths, $L(D)$ and $U(D)$, are estimated as

$$16. \quad L(D) = \Gamma^{-1}_{(D,1)}(\alpha/2) \text{ and } U(D) = \Gamma^{-1}_{(D+1,1)}(1-\alpha/2)$$

where Γ^{-1} represents the inverse of the gamma distribution and $D+1$ in the formula for $U(D)$ reflects a continuity correction made necessary by the fact that D is a discrete random variable and the gamma distribution is a continuous distribution. For a 95-percent confidence interval, $\alpha = .05$. For the death rate, it can be shown that

$$17. \quad L(R) = \frac{L(D)}{P} \text{ and } U(R) = \frac{U(D)}{P}$$

For more detail regarding the derivation of the gamma method and its application to age-adjusted death rates and other mortality statistics, see references 6, 74, and 79.

Availability of mortality data

Mortality data are available in publications, unpublished tables, and electronic products as described on the mortality Web site at the following address: http://www.cdc.gov/nchs/about/major/dvs/mortdata.htm. More detailed analysis than provided in this report is possible by using the Mortality public-use data set issued each data year. Since 1991 the data set is available through NCHS in CD-ROM format. Data are also available in the *Vital Statistics of the United States, Mortality, and Vital and Health Statistics*, Series 20 reports, and the *National Vital Statistics Reports* through NCHS.

Definitions of terms

Infant deaths—Deaths of infants aged under 1 year.
Neonatal deaths—Deaths of infants aged 0–27 days.
Postneonatal deaths—Deaths of infants aged 28 days–1 year.

Crude death rate—Total deaths per 100,000 population for a specified period. The crude death rate represents the average chance of dying during a specified period for persons in the entire population.

Age-specific death rate—Deaths per 100,000 population in a specified age group, such as 1–4 years or 5–9 years for a specified period.

Age-adjusted death rate—The death rate used to make comparisons of relative mortality risks across groups and over time. This rate should be viewed as a construct or an index rather than as a direct or actual measure of mortality risk. Statistically, it is a weighted average of the age-specific death rates, where the weights represent the fixed population proportions by age (82).

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